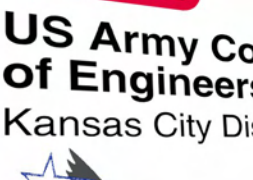
A Future For Kansas Wildlife

Kansas' Comprehensive Wildlife Conservation Plan

October, 2005



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Foreword

It is fitting that in this year, the 100th anniversary of our agency, that we are also developing a plan for our future. Much has changed since 1905, when state laws were enacted to create what was known as the Kansas Fish and Game Department. However, much has also remained the same. We still fund most of our fish and wildlife programs through sales of hunting and fishing licenses. This money has supported the recovery of many game species, and numerous important environmental and sensitive species conservation efforts. What is changing is the ability of anglers and hunters to support all of these great efforts along with mounting concerns about all species the agency is charged to conserve. That's where this State Comprehensive Wildlife Plan comes in.

The 2001 Congress approved legislation creating State Wildlife Grants to fund a broader scope of wildlife projects, patterned after the very successful Sport Fish and Wildlife Restoration Programs started in 1937 (wildlife) and 1950 (sport fish). In the State Wildlife Grants empowering language, each state is required to prepare a comprehensive plan to address specific requirements you will find in this document. Summarized, the plan's intent is to direct more attention toward species which have not received direct funding assistance in the past -- primarily nongame species. The overall goal for State Wildlife Grants and for this plan is to keep common species common, thus preventing the continual march of species towards state and federal endangered species listings. We believe that all Kansans, no matter what their affiliations or vocations, can agree with this goal.

If we expect to be able to continue the outstanding wildlife conservation programs we've enjoyed in our first one hundred years of existence, we will need broader public support. Hunters and anglers alone will not be able to supply additional dollars in the future to be able to maintain our critically important programs. This plan will be the framework for eventual broadening of our conservation efforts and funding sources. This effort is important to all Kansans, and we invite you to join us in helping to chart the future of our state's wild resources.

Sincerely,

J. Michael Hayden
Secretary
Kansas Department of Wildlife and Parks

EXECUTIVE SUMMARY

The development of Kansas' Comprehensive Wildlife Conservation Plan is based upon guidance provided by Congress, the U.S. Fish and Wildlife Service, and the International Association of Fish and Wildlife Agencies. It is funded in part by State Wildlife Grant T-8-1, Formulation of the Comprehensive Wildlife Conservation Plan.

This is a conservation plan for Kansas – not just for the Department of Wildlife and Parks. Therefore, at the earliest stages in the development of the plan, other stakeholders were brought into the process. Technical input was sought from over 200 technical experts in fish and wildlife conservation, from both within and outside the agency. The public was involved through regular commission meeting updates and opportunities for comment, and through interaction via the Internet. Department of Wildlife and Parks internal stakeholders were directly targeted for involvement through a special session at a major division meeting, and other internal communications.

Kansas' Comprehensive Wildlife Conservation Plan is a habitat-based plan, but it began with consideration of species. All species of fish and wildlife in Kansas were evaluated using six selection criteria, resulting in the identification of 315 species of greatest conservation need. These species of greatest conservation need were scored and ranked on the basis of six ranking criteria. This plan is based on the best available information, in accord with the intent established by Congress and echoed by the U.S. Fish and Wildlife Service and the International Association of Fish and Wildlife Agencies. As the plan is implemented, specific projects are expected to be designed to gather the most important pieces of missing information to fill the most important data gaps.

For purposes of stratifying the State, Kansas was divided into three conservation regions: (1) Shortgrass Prairie Conservation Region, (2) Central Mixed-grass Prairie Conservation Region, and (3) Eastern Tallgrass Prairie Conservation Region. Each of these regions is addressed in a major chapter of this report. Within each region, key habitats were identified and prioritized according to the degree of threat that exists for that habitat. Each key habitat is treated in its own section, in descending order of priority (threat), within each regional chapter. For each key habitat, there is a matrix showing the species of greatest conservation need using that habitat within the region and the ranking score and tier of each species of greatest conservation need. High scores, and Tier I indicate priority survey and research needs for the species in question. The real substance of the document, the strategies to achieve improved conservation of the key habitats for species of greatest conservation need, are presented for each key habitat for each of the important issues affecting the species of greatest conservation need within that habitat.

Some of the more comprehensive and widespread issues identified during this process are: (a) existing data gaps impede effective conservation planning and implementation, (b) land management practices over the past century have changed the structure of habitats over large areas, (c) fragmentation and conversion of habitat is

occurring, (d) invasive exotic plants and animals is a problem, and (e) natural resource management may affect habitat conditions.

Kansas' Comprehensive Wildlife Conservation Plan is based on the best available existing information, contributed by more than 200 technical experts on the various aspects of the Kansas' ecology and land management. A questionnaire captured basic distribution and abundance information, a half-day workshop with employees of the Department's Fish and Wildlife Division updated issues and strategies from previous planning efforts, and a 2-day Comprehensive Wildlife Conservation Plan Summit brought together more than 70 experts to review and confirm the technical information and to identify relevant issues, strategies, monitoring protocols and potential partners for each of the habitats within each conservation region.

For many species of greatest conservation need, some of the most basic information is simply not available. These data gaps are some of the most important research and survey needs, and will be among the projects to be funded with State Wildlife Grant funds, or funds from other conservation partners.

The purpose of any effort such as produced this Comprehensive Wildlife Conservation Plan is not to produce the plan – it is to implement the strategies and to produce better fish and wildlife conservation in the future. Such is the case with Kansas' Comprehensive Wildlife Conservation Plan. New funding will be focused on the priorities identified in this plan. And, as outlined in each major section, monitoring of new information and of conservation progress will identify changes that need to be made. Through on-going communication and coordination with all stakeholders, Kansas' Comprehensive Wildlife Conservation Plan will remain a vital, adaptive template for future fish and wildlife conservation efforts in the State.

Implementing this plan is the next step. This is a strategic plan – it is not an operational plan. It identifies broad priorities on species habitats, issues, and by inference, strategies and conservation actions. It is expected that through frequent contact with potential partners and stakeholders, as project proposals are developed addressing implementation of strategies directed at the top ranked species, habitats or issues, they will identify more specific details. It is also expected, and desired, that monitoring of performance and results will be included either in each project, or as separate monitoring projects. The Department of Wildlife and Parks will continue current efforts to facilitate partnership contacts through the Kansas Nongame Wildlife Advisory Council (KNWAC), ensuring that contact is established and maintained for purposes of reviewing priorities and coordinating implementation and monitoring efforts. Through ongoing communication and coordination with partners and potential partners, information will be examined on priorities, and projects will be developed to address top priority conservation actions (those associated with the top ranked habitats, issues, or species). It is expected that, frequently, project teams will be made up of employees from several agencies or organizations and will be funded jointly from several sources.

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INTRODUCTION AND PURPOSE

For years, fish and wildlife conservation in Kansas – and in the Nation – has been funded primarily by hunters and anglers. That funding was mainly through two sources: first, revenue from the sale of fishing and hunting and a few other types of licenses; second, federal excise tax revenue from sales of fishing and hunting equipment, apportioned back to States through the United States Fish and Wildlife Service according to set formulas (through the Pittman/Robertson, Dingell/Johnson, and Wallop/Breaux Acts). This system has been very effective at funding conservation of species that are hunted or fished. Through the Endangered Species Act, limited conservation of federally endangered and threatened species has also been possible. Although in the past, benefits have accrued to nongame species from projects and actions carried out for the benefit of hunted, fished and T&E species, with few exceptions (forage and prey species) there has been little federal funding specifically for nongame. Federal funding sources for these species were not available until recently and those funds are relatively small compared to those available for game species. The State of Kansas does have a small nongame fund, financed through a checkoff on state income taxes to address the approximately 80% of species that are neither hunted, fished, endangered nor threatened but there was no comparable federal funding mechanism to match or supplement these funds.

In the last decade or so, recognizing that there has not been enough revenue to fund research and management programs for all species of fish and wildlife, visionary leaders in the fish and wildlife conservation community have sought to provide a new source of funding for all species. In Kansas, a diverse coalition of conservation-minded individuals, agencies and organizations lobbied for passage of the necessary legislation at the national level.

The results have been encouraging. The Commerce, Justice and State Appropriations Act of Fiscal Year 2001, Title IX, Public Law 106-553 created the Wildlife Conservation and Restoration Program. Although this act provided only one year's appropriation of funds for fish and wildlife conservation, it identified the elements required to be included in the "wildlife conservation plan" that States committed to develop by October 2005. A second act, the Department of the Interior and Related Agencies Appropriations Act of 2002, Public Law 107-63, Title 1, created a "State Wildlife Grants Program" and required the states to develop "comprehensive wildlife conservation plans" by October 2005.

This report, Kansas' Comprehensive Wildlife Conservation Plan, funded in part by the State Wildlife Grants program, meets the requirements of both of these Federal acts. It is based on the best available information and points out data gaps where appropriate. It is the result of a huge effort involving virtually all of Kansas' conservation agencies and organizations, and coordinated by the Department of Wildlife and Parks. It is truly a plan for Kansas – not just for the Department of Wildlife and Parks.

The enabling legislation, along with regulations governing the State Wildlife Grants and related programs requires that Comprehensive Wildlife Conservation Plans include the following elements:

a) information on the distribution and abundance of species of wildlife, including low and declining populations as the Kansas Department of Wildlife and Parks deems appropriate, that are indicative of the diversity and health of Kansas's wildlife;
b) descriptions of locations and relative condition of key habitats and community types essential to conservation of species identified in (a);
c) descriptions of issues which may adversely affect species identified in (a) or their habitats, and priority research and survey efforts needed to identify factors which may assist in restoration and improved conservation of these species and habitats;
d) descriptions of conservation actions determined to be necessary to conserve the identified species and habitats and priorities for implementing such actions;
e) proposed plans for monitoring species identified in (a) and their habitats, for monitoring the effectiveness of the conservation actions proposed in (d), and for adapting these conservation actions to respond appropriately to new information or changing conditions;
f) descriptions of procedures to review the Comprehensive Wildlife Conservation Plan at intervals not to exceed 10 years;
g) plans for coordinating, to the extent feasible, the development, implementation, review, and revision of the Comprehensive Wildlife Conservation Plan with Federal, State, and local agencies and Indian tribes that manage significant land and water areas within Kansas or administer programs that significantly affect the conservation of identified species and habitats; and
h) provisions to ensure public participation in the development, revision, and implementation of projects and programs. Congress has affirmed that broad public participation is an essential element of this process.

This report is the result of a process that was specifically designed to meet the above required elements.

Although this report is required in order for Kansas to participate in the State Wildlife Grants Program, its purpose is far more basic. Although this plan began with species of greatest conservation need for Kansas, it evolved into a plan that identifies the most important habitats in our State, and the most significant threats (termed "issues" throughout this report) to these habitats. The most important elements of the document are the identification of priority conservation actions (termed "strategies" throughout this report) that can – and must – be taken by all individuals, agencies and organizations in order to conserve our wild heritage. The job of preserving and managing all of Kansas' fish and wildlife is too big for any one group or agency to achieve alone. This report identifies a roadmap of strategies that can be used by everyone in Kansas as our guide for years into the future.

For years, forward-thinking ecologists and others have encouraged that plans be built around habitats rather than species. There are many reasons for this. Perhaps the best reason is that whatever happens to the habitat ultimately determines the suitability for species and the ability of the species to survive/thrive. Kansas' Department of Wildlife and Parks is taking just such a forward-looking approach. This Comprehensive

Wildlife Conservation Plan is a habitat-based plan. Species of greatest conservation need were identified, but only for purposes of linking sets of species to key habitats around the state. Issues and strategies relate directly to key habitats within regions, and indirectly to species of greatest conservation need which occupy those habitats.

This is a strategic plan. It identifies broad priorities on species habitats, issues, and by inference, strategies. It is expected that through frequent contact with potential partners and stakeholders, as project proposals are developed addressing implementation of strategies aimed at the highest priority habitats, issues and species, they will identify more specific details. It is expected that, frequently, project teams will be made up of employees from several agencies or organizations and will be funded jointly from several sources.

APPROACH

Organizational Structure

The theme of Kansas' Comprehensive Wildlife Conservation Plan can be stated as "Keeping Common Species Common." A major premise of Kansas' approach to developing the Comprehensive Wildlife Conservation Plan was to use the best available, existing information – not to start from scratch or conduct new studies. The process relied heavily on experts and interested parties participating in the process, either through the questionnaire or the Kansas' Comprehensive Wildlife Conservation Plan Summit meeting, or both, to bring the best available information to the table for incorporation into the plan. The plan also draws heavily on the results of several previous planning efforts, previous statewide strategic planning efforts and in-house expertise.

A Planning Team of four individuals shared all responsibilities for project design and communicated regularly throughout the project. The initial meeting was held on September 7, 2004, between Kansas Department of Wildlife and Park's Wildlife Diversity Coordinator, Planner, and two representatives from the consulting group of Dynamic Solutions Group, LLC. A work plan was developed and agreed upon. The Planning Team then met with U. S. Fish and Wildlife Region 6 representatives (Paul Gertler, Assistant Regional Director for Migratory Birds and State Programs, and Amelia Orton-Palmer, Federal Assistance) to apprise them of the workplan.

More than 200 technical experts were identified and contacted to provide information on the 315 species of greatest conservation need through the use of a questionnaire. Issues and strategies identified in previous planning efforts were verified and updated by more than 125 Kansas Department of Wildlife and Parks staff who attended the Department's Fish and Wildlife Division annual meeting. The technical information on species, regions, habitats, population status and trend, and habitat status and trend was compiled into a 120-page workbook that served as the basis for "Kansas' Comprehensive Wildlife Conservation Plan Summit" held on the campus of Kansas State University on February 22-23, 2005. Keith Sexson, Assistant Secretary of the Kansas Department of Wildlife and Parks, provided the opening remarks and helped motivate thoughtful participation. Attendance was open, invited and specifically solicited. The summit purpose was to help produce the Comprehensive Wildlife Conservation Plan, and to help justify new funding and identify future priorities. Over two days, the more than 70 conference participants mainly focused on issues, strategies, research and survey needs, and monitoring protocols. They also identified potential partnerships important in implementation. The summit ended the intensive data-gathering phase. The 200 technical experts, 125 division employees, and more than 70 people attending the summit included the most knowledgeable individuals regarding Kansas' species, habitats and ecological relationships. They included individuals from academia, as well as conservation agencies and organizations. Through the questionnaire, the Division meeting and the Summit, species and habitat experts synthesized the best available, existing information and identified research and survey needs and data gaps.

The writing phase began almost as soon as the summit adjourned, with the first draft of the Comprehensive Wildlife Conservation Plan completed in April 2005. The

Internet proved highly useful during review and modifications. The final report was produced in July 2005.

Public Involvement and Partnerships

Public involvement was a necessary and appropriate component of this plan. In order for this plan to be meaningful, it was necessary for the public and potential partners to have input, to take ownership, and to help in accomplishing its goals.

As soon as the workplan was finalized in September 2004, work began on public involvement and developing partnerships. Stakeholder identification and analysis began with existing Department of Wildlife and Parks constituents and mailing lists. A statewide news release announced the initiation of the process, along with a mailing of 175 letters from the Secretary, inviting participation by interested organizations, governmental agencies, individuals and experts. A report on initiation of the plan was also presented to the Commission in October 2004, and reports were made at subsequent meetings (January, February, March and April, 2005) until the completion of the plan. Before each Commission meeting, a statewide news release is made, announcing the topics that will be addressed, and inviting public participation. After a meeting is held, another news release is made, reporting on what occurred. By being on the agenda, Comprehensive Wildlife Conservation Plan information was included in the public announcements. By the end of the process, five reports were given to the Commission during public meetings, giving the public notice and opportunity to participate in the process of plan development.

At the second Commission meeting, the Comprehensive Wildlife Conservation Plan web page was announced, which explained the purpose of the plan and provided background information. Comprehensive Wildlife Conservation Plan information was on the Kansas Department of Wildlife and Parks website, and was highlighted as a "hot topic." As progress was made, the site was updated, adding the species of greatest conservation need list (see Appendix 1), background documents, and the Questionnaire. The Draft Plan for public review was also posted on the Internet on May 20, 2005. Comments were formally taken until June 15, 2005. A general, statewide news release and e-mails to all summit participants announced its posting.

Kansas Department of Wildlife and Parks staff gave presentations and invited public participation at various organizational meetings of professional societies and the Kansas Nongame Wildlife Advisory Council.

A list of experts was compiled from existing documents and directories, and a Questionnaire soliciting information on criteria for ranking tiers of concern for species of greatest conservation need, population status, habitats used, condition of habitats, and rankings of endangerment of habitat type was distributed. This list included professionals from colleges and universities across the state of Kansas, State and Federal government employees in agencies related to wildlife, as well as species experts outside of academia who were acknowledged by those previously listed, or by wildlife-related organizations. These experts provided the best possible synthesis of the existing information, and identified data gaps which will be addressed during implementation.

Corroboration of information gathered from the questionnaire was the first agenda item at the summit meeting in Manhattan, Kansas on February 22, 2005. In order to solicit broad public participation, a statewide news release was distributed, an announcement was made at Commission meetings, and all people on the interested organizations and experts lists were sent email invitations. On the afternoon of that day, and on the next day, summit participants prioritized habitat types within three conservation regions, and identified top issues and strategies for those habitats.

More than 70 people attended the summit. Participants were from government agencies, private organizations, Kansas universities, the Kansas Biological Survey, the Kansas Nongame Wildlife Advisory Council, other organizations and private individuals. The Acknowledgement section lists most of the participants who assisted in the development of the Comprehensive Wildlife Conservation Plan.

The International Association of Fish and Wildlife Agencies, through Teaming with Wildlife, has taken a leadership role in the funding of the State Wildlife Grant program, and in bringing together all the states through workshops, meetings, and conferencing via telephone to disseminate information. Kansas Department of Wildlife and Parks personnel participated in two workshops, numerous surveys and updates, and coordination calls.

Coordination with Other Agencies and Tribes

Other agencies were notified by letter from the Secretary that the process of Comprehensive Wildlife Conservation Plan development was being started. In addition, other agency experts were asked to give input on the questionnaire. All wildlife-related agencies were invited to the summit, and were notified of the posting of the draft Plan to the Internet by e-mail. Federal agencies that were notified included U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. Forest Service, Natural Resources Conservation Service, Environmental Protection Agency, and Bureau of Reclamation. State agencies include the Department of Agriculture, Department of Health and Environment, Kansas Forest Service, and State Conservation Commission. Potential partnerships are identified in chapters dealing with individual Conservation Regions. In addition, Tribes in the State of Kansas were specifically invited to participate.

METHODS

Kansas' Comprehensive Wildlife Conservation Plan is a habitat-based plan with additional attention to educational and recreational issues and needs. The overall goal of the Comprehensive Wildlife Conservation Plan is to keep common species common. The planning model followed in Kansas included the identification of important species, conservation regions, habitats, conservation issues and conservation strategies, along with on-going monitoring to evaluate progress and identify needed changes in the system(s).

These were identified with the understanding that this Comprehensive Wildlife Conservation Plan is Kansas' plan – not just a plan for Department of Wildlife and Parks. Kansas' plan is based on the best available information – in keeping with the intent identified in the enabling legislation and in guidance by the U.S. Fish and Wildlife Service and the International Association of Fish and Wildlife Agencies. In many cases, and for many species of greatest conservation need, additional efforts are badly needed to improve information on such items as distribution and abundance.

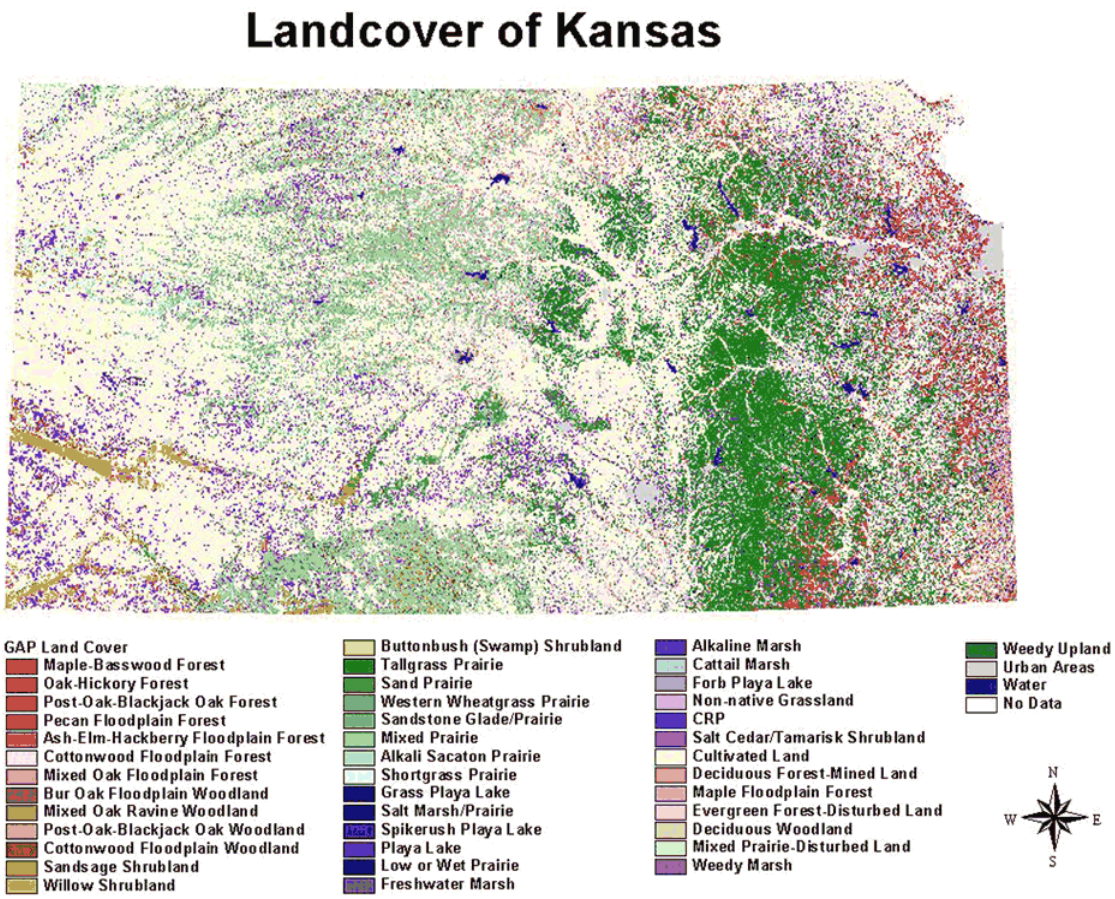
Compiling Species Lists, Defining Habitats and Conservation Regions.

A list of species native to Kansas was compiled, using the Kansas Gap Analysis Program[1], NatureServe[2], A Checklist of the Vertebrate Animals of Kansas (Potts and Collins, Third Edition), herpetological and bird check lists, Kansas Natural Heritage inventory of Rare Vertebrates of Kansas list, American Society of Mammologists State list for Kansas, Freshwater Mussels of Kansas (Mark E. Eberle, Fort Hays State University, Hays, Kansas, revised 12/28/02), Checklist of Kansas Odonata, (Roy Beckemeyer, Windsofkansas.com, updated 1/19/2004), Common and Scientific Names of Fishes Collected During the Kansas Department of Wildlife and Conservation Stream Surveys, (from www.ksu.edu/ksaquaticGap Analysis Program/fishlist.xls), State of Kansas Species in Need of Conservation List, Kansas Threatened and Endangered Species List, Species list from Marais des Cygnes National Wildlife Refuge Draft Environmental Assessment, Appendix D (U.S. Fish and Wildlife Service, March 2003), and Butterflies in Kansas (www.gpnc.org/butterfl1.htm) among others.

Species were evaluated, based on 6 criteria, and if qualified under at least one, were considered to be species in greatest conservation need. (See Appendix 2) The resulting 315 species of greatest conservation need were then ranked according to 6 criteria. Information on population abundance and trend (two of the six criteria) was gathered at the Comprehensive Wildlife Conservation Plan Summit, based on the expertise of the 70 attendees, and incorporated into the rankings. Kansas Department of Wildlife and Parks Planning team members filled in values for the other criteria with assistance from selected experts. This process is shown in detail in Appendix 1 "Kansas' Species of Greatest Conservation Need – Selection and Ranking". After rankings were totaled, they were separated into approximately three equal tiers, based on natural breaks. These tiers were used to group species generally within all species of greatest conservation need. This ranking established a baseline against which future evaluations and monitoring can be compared, on a species basis. It will also be used to prioritize research and survey efforts within each habitat section from ranked issues.

[1] The Kansas Gap Program operated through Kansas State University provides geographic information on the status of species and their habitats. The resulting land cover map provides an overview of vegetative cover to help evaluate species distribution and needs.

[2] NatureServe (natureserve.org) is a non-profit conservation organization which provides scientific information which helps guide conservation actions and supplies species information for efforts such as this plan.

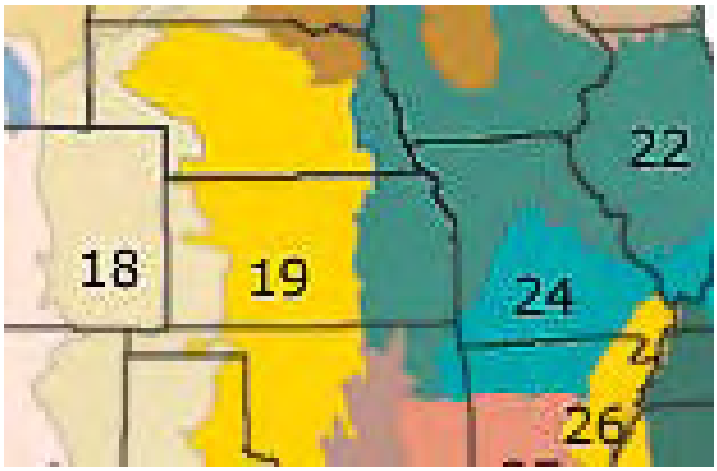


Kansas Applied Remote Sensing Program. 2002. Kansas Vegetation Map. Lawrence, Kansas: Kansas Biological Survey, University of Kansas

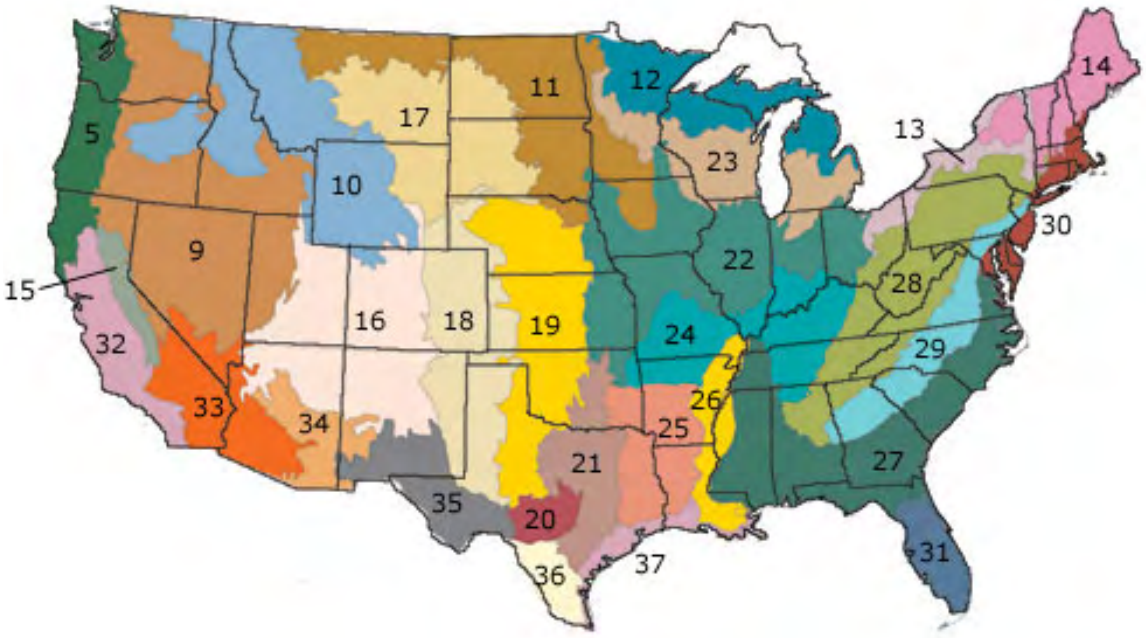
Figure 1 - Landcover of Kansas

Habitats were taken from the Kansas Gap Analysis Program, and collapsed into broader types. (See Figure 1 for the land cover map of Kansas.) Aquatic habitats were determined with input from Kansas Department of Wildlife and Parks staff, and Fish Ecoregions of Kansas: Stream fish assemblage patterns and associated environmental correlates, (Hawks, Miller and Layher, 1986). Appendix 5 listed the CWCP habitats and provides a description.

Kansas' CWCP Conservation Regions



18 – Short Grass Prairie Conservation Region
19 – Central Mixed Grass Prairie Conservation Region
22 – Eastern Tallgrass Prairie Conservation Region



From Bird Conservation Regions Map, U.S. NABCI Committee, September 2000.

Figure 2 – Kansas' CWCP Conservation Regions:

The ecoregions defined by the North American Bird Conservation Initiative (Figure 2) and refined by the Playa Lakes Joint Venture were adopted as the conservation regions in this plan.

Compiling the Questionnaire

The Questionnaire was then prepared, listing all Kansas native species, species of greatest conservation need and their rankings, a list of habitat types, a table of species requesting association with habitat types, a table with relative condition of habitats, and request for prioritization of habitat types. This Questionnaire was sent out to about 200 experts, and posted on the Internet with a public announcement through the Commission meeting report. Input was taken for approximately 30 days, and the information recompiled for the summit meeting.

Identifying Priorities, Issues, Strategies:

Identifying Priorities: During the summit, participants were asked to set priorities for species of greatest conservation need, habitats within conservation regions, and issues within habitats. Habitats within conservation regions were prioritized according to which are most threatened. Issues within habitats were prioritized according to which are the greatest threats to the goal of "keeping common species common." Species of greatest conservation need were prioritized as described in Appendix 2. Species were placed into one of three tiers, depending upon the scores received through this criteria-based ranking system. During implementation, projects to address tier 1 species will receive the initial attention. Likewise, primary attention and funding will be given to projects that deal with highest priority habitats within conservation regions or highest priority issues within habitats. Although strategies were not prioritized within issues, the implementation approach will be that projects addressing strategies associated with higher ranked issues and habitats will receive first attention. It was our intent, in the design of the ranking process, to leave some flexibility, but to establish a broad set of priorities through the ranking of species of greatest conservation need, habitats, and issues.

Prioritizing Research and Survey Efforts: At the Kansas' Comprehensive Wildlife Conservation Plan Summit meeting, within each conservation region, key habitats are listed in priority order. For each key habitat, issues are listed in priority order. For example, during the implementation phase, priority will be given to projects that address a conservation action associated with a highly ranked habitat or issue, or to a research and survey effort which addresses the needs identified for the highest ranked key habitats (those listed first within each conservation region). Within each key habitat section within each conservation region is a table showing the priority ranking score and tier of each species of greatest conservation need. High scores, and Tier I indicate priority research and survey needs for the species in question.

Issues & Strategies:: "Conservation issues" in this plan is the term used for the "conservation problems/threats" identified by Congress. Two processes were used for this step. First, issues and strategies were identified in the Kansas Department of Wildlife and Parks Wildlife Diversity Plan and the Kansas Central Grasslands All-bird Workshop. Partners in Flight plans were examined for additional strategies, as were elements in the Playa Lakes Joint Venture plans. These issues and strategies were discussed at the Kansas Department of Wildlife and Parks Fish and Wildlife Division meeting, and were reviewed for current applicability and updated where needed.

Second, issues and strategies were identified at the summit meeting. The State was divided into three ecologically distinct conservation regions. Species of greatest conservation need were used as the basis for identifying key habitats. Habitats were prioritized within the conservation regions. Issues were identified according to their impact on conservation and management of the species of greatest conservation need within key habitats, within the conservation regions. Strategies (conservation actions) were then identified to solve or manage these issues. Strategies were also identified that will result in improving essential knowledge and understanding of important elements in the entire equation. Educational and recreational aspects were considered in these elements. Strategies are not prioritized under the issues. They are generally grouped into education-related, research and survey, and implementation and management actions.

The strategic actions identified in the Comprehensive Wildlife Conservation Plan are meant to serve as guidance and to help focus the efforts of all conservation agencies and partners working in Kansas. Potential partners and others are reminded that this document is a strategic plan. As a general rule, primary attention should be given to project development for purposes of implementing strategies addressing top ranked habitats, issues, or SGCN's. Through this method of selection, prioritization of strategies will be accomplished at the operational level.

How to Use This Plan: Implementation, the Next Step

This is a strategic plan. It identifies broad priorities on habitats, issues, and species and by inference, strategies/conservation actions. It is expected that through frequent contact with potential partners and stakeholders as project proposals are developed addressing implementation of strategies aimed at the top ranked habitats, issues, or species, more specific details will be identified. It is also expected, and desired, that monitoring of performance and results will be included either within each project, or sometimes as separate monitoring projects. The Department of Wildlife and Parks will facilitate this partnership contact through existing processes, including coordination with the Kansas Nongame Wildlife Advisory Council. Through ongoing communication and coordination with partners and potential partners, information will be examined on priorities and projects will be developed to address top priority conservation actions (those associated with the top ranked habitats, issues, or species). It is expected that frequently project teams will be made up of employees from several agencies or organizations and will be funded jointly from several sources.

Adaptive Management and Monitoring

Adaptive Management. Adaptive management has been used by good planners and managers for decades. Adaptive management involves four essential pieces: (1) developing plans, (2), implementing those plans, (3) monitoring the effects of management actions, and (4) adjusting future plans. This approach is being applied in Kansas. Monitoring and adaptive management will be facilitated through processes involving the Department of Wildlife and Parks and potential partners. Through ongoing communication, supplemented by this process, ideas for projects can be exchanged and coordinated, information from existing surveys can be shared, and projects can be

developed for implementing top strategies from this plan ("top" strategies being those addressing highest ranked habitats, issues, and species).

Monitoring. Monitoring approaches are identified within each key habitat within each conservation region. Monitoring is crucial to employing adaptive management approaches and ensuring that strategies are having the desired results. It is an ongoing part of management by the Department of Wildlife and Parks, and many other agencies and organizations. Existing monitoring/data-gathering processes will be the basis for assessing the results of implementation of this plan. As individual projects are developed, evaluation/monitoring will be part of each project. In addition, specific projects, solely for monitoring, may be designed and implemented. Because this is a habitat-based plan and not one based solely on species, monitoring may occur for habitats. In some case, new approaches will have to be developed, and in other cases, information will be available from partner agencies and organizations. Monitoring of some species (indicator or keystone species), will provide relevant information for evaluating plan success. The appropriate geographic scale for monitoring/measuring success will be used. This includes monitoring species of greatest conservation need at the statewide, conservation region, and habitat scales, and monitoring success of individual implementation projects at the scale of the particular project. These monitoring projects will analyze both performance measures and achievement of actual changes in habitats or species status.

In keeping with the concepts behind the design of the Kansas Comprehensive Wildlife Conservation Plan approach and advice from the U.S. Fish and Wildlife Service and the International Association of Fish and Wildlife Agencies, at first Kansas' monitoring will employ existing surveys and inventories, including monitoring being done by conservation partners. As with the concept of using the best available information and not gathering new information on which to base this plan, the same concept applies to monitoring. Kansas' Department of Wildlife and Parks and other potential partners in implementing this plan have ongoing, standardized surveys to monitor a host of parameters dealing with species and habitats in Kansas. Information from these existing data gathering efforts will be meshed with information from additional monitoring efforts to provide the best, comprehensive picture of plan results. Monitoring will initially be focused on priority research and survey needs to obtain basic information. Monitoring will also be used to determine when strategies have adequately addressed various issues. When conservation success is not what was anticipated, monitoring will allow plans to be updated and altered so that new actions can be developed and implemented – the "adaptive" part of adaptive management. In a number of cases, monitoring or research will need to be the first step, to determine existing conditions where this basic knowledge does not now exist.

As implementation of Kansas' Comprehensive Wildlife Conservation Plan proceeds, and knowledge builds, monitoring will shift to include tracking tangible achievement of resource conservation. Again, in many cases, monitoring may rely heavily on conservation partners. As knowledge accumulates and issues are addressed, new strategies will become possible. As this plan is implemented through operational planning and specific, detailed projects, it is anticipated that achieving positive conservation results may in many instances take several years. It will be necessary to

maintain emphasis on monitoring to determine when, and to what extent, tangible results are achieved, and to decide when changes may need to be made in actions.

KDWP is required by State statute to evaluate the State Threatened and Endangered Species List, and the Species in Need of Conservation list every five years. This process requires extensive coordination with other agencies and groups concerned with conserving these species and the effects of this action on commerce and industry, similar to the Federal listing process. In addition, by replicating the Questionnaire process every five years, trends can be monitored.

STATEWIDE PERSPECTIVE

Institutional Background

The Kansas Department of Wildlife and Parks have been responsible for overseeing the conservation of game and nongame species in Kansas since passage of its authorizing legislation. While once retaining broad authority over the conservation and regulation of Kansas forests, soil and water, as well as wildlife, the role of the state's wildlife agency has been clarified by the creation of other agencies with more definitive conservation-related responsibilities. In 1987, the Kansas Fish and Game Commission was combined with the Kansas State Park Authority by executive order, resulting in the Kansas Department of Wildlife and Parks.

The statute mandate of the Department regarding its conservation obligations is contained in K.S.A. 32-702:

> **It shall be the policy of the state of Kansas to protect, provide and improve outdoor recreation and natural resources in this state and to plan and provide for the wise management and use of the state's natural resources, thus contributing to and benefiting the public's health and its cultural, recreational and economic life. For these purposes, the secretary, the commission and the department are hereby vested with the duties and powers hereinafter set forth.**

Additionally, the KDWP Mission Statement is contained in "Focus 2002, Strategic Plan for Kansas Department of Wildlife and Parks" and states the agency's broad responsibilities regarding wildlife and recreation:

> **Conserve and enhance Kansas natural heritage, its wildlife and its habitats--to ensure future generations the benefits of the state's diverse, living resources;**
>
> **Provide the public with opportunities for the use and appreciation of the natural resources of Kansas, consistent with the conservation of those resources;**
>
> **Inform the public of the status of the natural resources of Kansas to promote understanding and gain assistance in achieving this mission.**

Throughout its history, the Department has developed primary efforts for consumptive users who have provided the majority of funding through license fees. As a result, the agency has focused programs for game species. Nonetheless, this management approach has benefited many nongame wildlife species through various land and water conservation activities and regulations. It is recognized that in some situations, specific management actions will have varying impacts on all species. The majority of these conservation activities and regulations have been directed by federal aid rules and regulations of the federal Sport Fish and Wildlife Restoration Program along with obligations towards the primary funding source for programs directed for hunting and fishing. Not until 1975 was specific Kansas legislation adopted to address nongame species through passage of the Kansas Nongame and Endangered Species Conservation

Act. Largely as a result of national initiatives for endangered species conservation, this Act prompted the designation of a portion of an existing staff position to work on nongame efforts along with efforts towards seeking funding sources for nongame programs.

Nationally, major needs for nongame were recognized by the passage of the Fish and Wildlife Conservation Act of 1980. While federal funds were never appropriated to meet the needs of nongame, Kansas adopted the Chickadee Checkoff voluntary contribution program in 1980. Chickadee Checkoff, which supports the Kansas Nongame Wildlife Improvement Fund, was established through the impetus of the Fish and Wildlife Conservation Act of 1980, the federal Endangered Species Act, and various state wildlife conservation organizations. The checkoff has averaged about $150,000 income per year with funds being spent on a variety of educational, research, and habitat programs besides some administrative and promotional costs. In 1980, the Kansas Nongame Wildlife Advisory Council was organized to help initiate legislation to fund nongame programs and to serve at the pleasure of the Director of the Department to give policy guidance. Currently, the Kansas Nongame Wildlife Advisory Council has fourteen [11 voting and 3 ex-officio] members. The role of the Kansas Nongame Wildlife Advisory Council as embodied in bylaws of the organization is:

> **It shall be the role of the Kansas Nongame Wildlife Advisory Council to serve as a citizens' advisory group to the Department of Wildlife and Parks by offering advice to the Secretary and the immediate staff on the integration of nongame wildlife efforts into all levels of the department.**

Section 2 of Article II of the Kansas Nongame Wildlife Advisory Council bylaws details other aspects of its advisory role and involves review and recommendations concerning program plans, guidelines for research, and management projects; and in providing expertise, a medium for information exchange, additional ideas for Department considerations, and issues of concern, along with assisting the Department in developing funding sources for nongame wildlife. In addition to its own statutes and regulations, the Department cooperates with other state and federal agencies in fulfilling its mission. These include, most often, the U.S. Fish and Wildlife Service, Kansas Biological Survey, Kansas State Extension Service, Natural Resource Conservation Service, State Conservation Commission, Kansas Department of Health and Environment, U.S. Army Corps of Engineers, Bureau of Reclamation, Kansas Forest Service, universities, and other state, federal, and local institutions. Memoranda of Agreements or Understandings are active with many of these agencies relative to joint interests and programs.

Many wildlife and environmental conservation organizations cooperate with the Department and its personnel. These include Audubon of Kansas, Comanche Pool Prairie Resource Foundation, Ducks Unlimited, Kansas Academy of Science, Kansas Association of Conservation Districts, Kansas Chapter of the American Fisheries Society, Kansas Chapter of The Wildlife Society, Kansas Farm Bureau, Kansas Association for Conservation and Environmental Education, Kansas Herpetological Society, Kansas Livestock Association, Kansas Ornithological Society, Kansas Trappers Association, Kansas Wetland and Riparian Alliance, Kansas Native Plant Society, Kansas Wildlife Federation, Pheasants Forever, Rocky Mountain Elk Foundation, Quail Unlimited, Sierra Club, Tallgrass Legacy Alliance, The Nature Conservancy, various public area friends groups, and many other city, regional and state organizations.

Kansas Wildlife Resources

Primarily because of traditional contributions of sport fish and wildlife interests towards wildlife conservation in Kansas and elsewhere, wildlife has been generically categorized as "game" and "nongame." The wildlife agency has no statutory obligations granted towards plants although some activities certainly address plant conservation through biological community associations and management.

The Department is responsible for the management of about 798 species of vertebrates. This includes 468 bird species, 89 mammals, 144 fishes, 53 reptiles, and 30 amphibians. Additionally, approximately 24,000 species of invertebrates, including mussels, crustaceans, and insects are under jurisdiction of the Department. There are presently 59 species listed as State Threatened or Endangered and an additional 70 species on the Species In Need of Conservation List. This list is reviewed every five years as per amendments to the Nongame and Endangered Species Act of 1975.

Overall, Statewide Issues and Strategies:

In order to utilize the in-house expertise, and make use of existing plans, issues and strategies from previous planning efforts (the Wildlife Diversity Plan and the All-Bird Workshop) were brought before the Department's Fish and Wildlife Division for review of applicability and updating. Many of these issues and strategies were applicable on a statewide basis, and are included below. Those that are more applicable to specific habitats or conservation regions are included in those sections.

From the many perspectives we listened to concerning the future of Kansas' fish and wildlife, certain themes emerged over and over. Although the details are shown in the chapters that address specific geographic areas and habitats, the general themes are identified here for providing overall, statewide perspective.

Many of the conservation issues identified in the three regional chapters can be summarized as follows: (a) existing data gaps impede effective conservation planning and implementation, (b) land management practices have changed the structure of habitats over large areas, (c) fragmentation and conversion of habitat is occurring (d) invasive exotic plants and animals is a problem, (e) natural resource management may affect habitat conditions, and (f) inadequate coordination between government agencies who may have conflicting goals for resource management.

Also, several additional issues related primarily to public education continued to emerge throughout preparation of the Comprehensive Wildlife Conservation Plan, including during a special "related topics" session held during the Summit.

Perhaps the most relevant program to the implementation of the Comprehensive Wildlife Conservation Plan is the State's existing and continuing program to develop recovery plans for state listed threatened and endangered species and those on the Species in Need of Conservation lists. These are distinct from federal recovery plans for

federally listed species. Species on the state sensitive species lists represent the most logical group of animals in jeopardy and likely candidates for potential future federal listing status. Therefore, it was reasonable to weight the state-recognized species currently on the Kansas Threatened and Endangered Species List and the Species in Need of Conservation List in the ranking process for the CWCP Species of Greatest Conservation Need. Currently there are 34 threatened, 25 endangered and 70 Species in Need of Conservation on the Kansas lists. Recovery plans which offer specifics at an operational planning level have already been developed as listed below. We plan to complete recovery plans for all species on the Kansas lists. Strategies already presented in these plans represent an initial source of priorities related to the CWCP and should be treated accordingly and as adjunct to those presented in the prioritized habitat sections in the CWCP.

Recovery Plan for Four Freshwater Mussels in Southeast Kansas: Neosho Mucket—*Lampsilis rafinesqueana;* Ouachita Kidneyshell—*Ptychobranchus occidentalis;* Rabbitsfoot—*Quadrula cylindrica cylindrical;* Western Fanshell—*Cyprogenia aberti*

Kansas Recovery Plan for Freshwater Mussels in the Upper Osage River system, Kansas: Mucket. *Actinonaias ligamentina*; Elktoe. *Alasmidonta marginata*; Rock Pocketbood, *Arcidens confragosus*; Purple Wartyback . *Cyclonaias tuberculata*

Kansas Recovery Plan for Three Big River Fish Species: Sicklefin chub *(Macrhybopsis meeki),* Sturgeon Chub *(Macrhybopsis gelida),* and Western silvery minnow *(Hybognathus argyritis)*

Recovery Plan For Four Salamander Species of Cherokee County, Kansas: Cave salamander, *Eurycea lucifuga* (Rafinesque); Many-ribbed salamander, *Eurycea multiplicata griseogaster* (Moore and Hughes); Grotto salamander, *Typhlotriton spelaeus* (Stejneger); Longtail salamander, *Eurycea longicauda melanopleura* (Cope)

Recovery Plan for the Arkansas Darter, *Etheostoma cragini* Gilbert, in Kansas

Kansas Recovery Plan for the Slender Walker Snail, *Pomatiopsis lapidaria (*Say) In Kansas

Recovery Plan for the Scott Riffle Beetle, *Optioservus phaeus,* in Kansas

Kansas Recovery Plan for the Snowy Plover (*Charadrius alexandrinus*)

Recovery Plan for the Topeka shiner (*Notropis topeka*) in Kansas

Statewide Issues and Strategies:

Issue:

▶ Data on species habitat needs is incomplete.

Strategies:

- Develop a state biodiversity plan to include inventory and monitoring and community restoration strategies.
- Document nongame wildlife use of different habitat types and identify essential habitats of mammalian and other species that need increased conservation, further study, and/or management.
- Continue to develop recovery plans for all species on the state sensitive species lists.
- Produce geographic information system mapping with layers for wetlands, riparian areas, sensitive areas, public ownership, breeding bird data, fish and wildlife distribution and abundance, species ranges and aquatic habitat parameters, and incorporate with Gap Analysis Program.
- In urban areas, determine the status or requirements of nongame wildlife through urban, regional, or statewide habitat inventories, and develop areas where a large number of people will benefit from associated values.
- Expand and coordinate databases concerning species of greatest conservation need and their associated habitat characteristics.
- Periodically update the Kansas Breeding Bird Atlas.
- Increase scope and diversity of avian research in the state, including, but not limited to such innovative programs as isotope tracing to identify exact winter range habitats for species that nest in Kansas.
- Expand statewide, standardized surveys to update stream assessments and monitoring of Kansas' fish populations and their habitats, and incorporate the data into geographic information systems.
- Continue standardized population and quantitative aquatic habitat evaluation procedures and publish in a technical handbook.
- Develop species-specific studies on effects of varying rangeland management techniques.
- Research effects of habitat fragmentation.
- Implement a non-indigenous species management plan for Kansas.

Issue:

▶ Habitat is being altered in ways that are detrimental to species needs.

Strategies:

- Promote improved water quality standards and efforts for minimum desirable stream flows.
- Promote sound water quality standards and their enforcement through education and continued coordination with the Kansas Department of Health and Environment, and the linkage of stream ratings, dependent on the presence of rare fishes, unique assemblages, or high biodiversity.
- Monitor impacts to fisheries from pollution sources.
- Identify pollution problem areas and improve conditions detrimental to biodiversity and endangered species.

- Work with other state agencies to reduce impacts to habitat from their programs.
- When in the process of developing management plans and actions for game species, consider the effects on nongame species, and incorporate modifications that cause the least damage, or could also benefit nongame species.
- Continue to broaden support for federal farm programs, i.e. Conservation Reserve Program, Swampbuster, etc.
- Determine if wildlife damage control practices are detrimental to non-target wildlife, promote environmentally safe methods, and inform public and private entities.
- Assess habitat fragmentation and its implications to natural community changes through Gap Analysis Program.
- Increase funding for Grassland Reserve Program and conservation easements to reverse trend of conversion of grassland to cropland, and encourage appropriate re-conversion of cropland back to grassland.
- Ameliorate grazing impacts by designing wildlife friendly grazing systems, drought management plans, and conservation payment systems.
- Use Conservation Reserve Program as a grassbank to allow recovery of native range.
- Develop methods to increase range plant diversity.
- Monitor wind farming for habitat fragmentation.
- Support more research on the impact of dams on aquatic ecosystems and fauna.

Issue:

- ▶ Invasive species decrease the quantity and quality of key habitats for species of greatest conservation need.

Strategies:

- Expand cooperative programs that supply technical and direct assistance for nuisance plant and animal control problems and efforts.
- Promote and fund research and management to control *lespedeza cuneata t*hat doesn't sacrifice native plant diversity.
- Evaluate impacts of commercial harvest and dumping of baitfish on native fish populations.
- Develop plans to prevent the invasion of exotic fish such as round gobies, *Neogobius melanostomus*, European ruffe, *Gymnocephalus cernuus*, and black carp, *Mylopharyngodon piceus*.
- Assess exotic plant problem in Kansas, including on Department of Wildlife and Parks lands.
- Determine the effect of the spiny water flea on native zooplankton and fish species.
- Assess the extent and threats of feral hogs, and develop a management plan for control and possible elimination.
- Control woody invasion and exotics with prescribed burning and by mechanical means.
- Fully assess potential problems with contamination, introduction of exotics, and genetic issues.
- Evaluate impacts of exotic introductions, diseases, and parasites and ways to mitigate; and develop contingency plans for managing exotic wildlife.

Issue:

- Habitat improvement and preservation are not assured for key habitats.

Strategies:

- Use geographic information systems to assist local governments with planning, and with Department wildlife diversity planning.
- Develop staffing and strategies to address mushrooming conservation planning needs for multi-state species such as black-tailed prairie dog, swift fox, lesser prairie chicken, mountain plover and additional species' conservation planning.
- Seek compliance of habitat conservation efforts receiving Kansas Department of Wildlife and Parks funds with appropriate laws, regulations, and wildlife conservation ethics.
- Supply information to city land use planners and developers related to wildlife values and habitat needs.
- Continue the Kansas Backyard Wildlife Habitat Improvement and Certification Program and green space concepts to reduce habitat fragmentation impacts.
- Consider program similar to Backyard Wildlife Habitat Certification Program for aquatics that registers privately-owned stream reaches that provide valuable nongame fish habitat.
- Seek to prevent degradation of habitat predisposing a species to significant reductions in their distribution or abundance.
- Secure or lease property in areas of special interest for herps and other nongame species through landowner friendly measures.
- Encourage construction of fish ladders in rivers with instream structures that obstruct fish migrations and provide opportunities for fish viewing where possible and desirable.
- Promote ecologically sound techniques for flood control, erosion control, non-point source pollution control, and bank stabilization which will provide high aquatic habitat diversity, and determine engineering techniques for preventing monotypic habitats.
- Enhance wetlands and develop riparian buffers to improve fish habitats.
- Provide support for removing low water dams where feasible.
- Acquire rare, critical or important habitats, especially wetlands, through willing sellers.
- Acquire corridors through willing sellers, and consider habitat fragmentation in acquisition plans.
- Acquire, as advisable and possible, water rights for wetlands, and research and develop engineering techniques for efficient wetland management.
- Maximize habitat diversity on wetlands for nongame species.
- Address recovery plan priorities for freshwater mussels.

Issue:

- Some nongame species populations are declining, and some suitable available habitat is not being used.

Strategies:

- Implement and enforce laws and regulations that prevent over-exploitation of populations, predisposing a species to signification reductions in abundance.

- Reintroduce certain species if habitat and biological conditions are suitable to permit sustainability and social acceptance is attained.
- Monitor harvests of bullfrogs and snakes more closely.
- Utilize fish culture system for recovery projects and activities.
- Expand investigations of illegal commercial trade of wildlife.

Issue:

▶ Data on species populations and distribution is incomplete.

Strategies:

- Enhance study and conservation efforts of bats.
- Initiate public volunteer monitoring surveys of nongame species.
- Initiate nongame bird surveys on Kansas Department of Wildlife and Parks lands.
- Initiate 5 or 10-year interval distributional surveys of greater and lesser prairie chickens, and other declining bird species.
- Implement a structured census for reptiles to provide initially a good baseline data set and eventually trend information on populations and ranges.
- Continue and expand the Kansas Amphibian Monitoring Program.
- Investigate contaminant effects on reptilian and amphibian populations.
- Continue to assist with the promotion of annual and special counts of herps (reptiles & amphibians).
- Inventory all public lands for amphibians and reptiles.
- Develop more research on biology and ecology of herps.
- Survey genetic diversity within fish species.
- Cooperate with universities to upgrade fish reference collections.
- Develop more research related to ecology and systematics of fishes.
- Support university analyses of existing data to determine physical habitat-fish community interactions.
- Expand statewide assessments of inventory, abundance, species diversity, population data and environmental requirements for freshwater mussels.
- Use stream monitoring program to increase distribution knowledge of aquatic mollusks and other invertebrates.
- Continue long-term sampling of freshwater mussels at 5-year intervals, and establish new monitoring sites.
- Study other overlooked invertebrate groups such as insects, crayfish, etc.
- Investigate contaminant effects on reptilian and amphibian populations.

Issue:

▶ Habitat, population and life history work demands attention beyond just the Department of Wildlife and Parks' obligation.

Strategies:

- Identify cooperators and partners for needed work.
- Develop an All-birds Conservation Program in Kansas.
- Cooperate with Audubon relative to the Important Bird Areas program.
- For mammals, describe habitat associations and measure the trends in habitat distribution and quality in coordination with Central Plains Society of Mammalogists.
- Cooperate with Partners in Flight and national waterbird and shorebird initiatives.
- Maintain close coordination with the Kansas Herpetological Society.

- Initiate active participation in the National Amphibian Conservation Program.
- Continue participating in the National Amphibian Abnormality Monitoring Program.
- Coordinate projects and programs with the Kansas Chapter of American Fisheries Society.
- Become involved directly with the North American Bird Conservation Initiative.
- Continue to assist with the Kansas Freshwater Mussel Workshop and similar efforts to promote the conservation of the state's aquatic resources.
- Work with the Kansas Department of Agriculture on biological controls of pest insects rather than chemical treatment to reduce impacts to non-target invertebrates.
- Cooperate with the state and federal Department of Agriculture in developing management strategies for coping with potential problems from exotic livestock and wildlife introductions.
- Coordinate with Native American Tribes.

Issue:

▶ A variety of entities control significant land and water management capabilities and actions that can be implemented to enhance nongame species.

Strategies:

- Continue to provide and expand the Department's Wildlife Education Service and Wildlife Reference Center.
- Implement seasonal naturalist programs with emphasis on habitat.
- Supply Kansas Department of Wildlife and Parks magazine free of charge and ensure diversity of articles.
- Create a cooperative opportunity to fund an all-taxa (species) inventory.
- Cooperate in terrestrial and aquatic Gap Analysis Program effort.
- Work with U.S. Army Corps of Engineers and Bureau of Reclamation on reservoir lands.
- Cooperate with U.S. Fish and Wildlife Service on National Wildlife Refuges.
- Assist landowners in identifying areas important to birds and other nongame species.
- Develop habitat demonstration and viewing areas for reptiles and amphibians on wildlife areas, state parks and visitor centers.
- Cooperate with the Kansas Biological Survey and other entities in identifying priorities and opportunities for wildlife conservation. The Nature Conservancy's ecoregional plans that identify a portfolio of sites most important for conservation of biodiversity (and that were developed with assistance from Kansas Biological Survey and many others), should be utilized.
- Develop partnerships (federal, state, local agencies and non-governmental organizations) for manpower and equipment for prescribed burning.

Issue:

▶ Lack of information on public attitudes towards wildlife, their knowledge of wildlife related issues, and their level of participation in wildlife related activities makes it difficult to structure and implement effective programs.

Strategies:

- Use existing socioeconomic data to develop a profile of wildlife users emphasizing urban populations.

- Conduct human dimensions surveys to assess the public's attitudes, knowledge, and levels of participation related to wildlife activities.
- Implement procedures for documenting routine public comments and inquiries related to wildlife issues.
- Satisfy multi-cultural informational needs.
- Develop an inventory of resources and expertise with regard to developing wildlife oriented recreational and educational opportunities.

Issue:

▶ Lack of wildlife viewing programs inhibits development of public understanding and support of nongame programs.

Strategies:

- Develop additional nature trails, viewing blinds, birding trails, aquatic and terrestrial wildlife viewing sites, and support materials on public and private lands.
- Develop a walk-in wildlife viewing access area program.
- Encourage the development of more nature centers and aquaria.
- Work with local governments to incorporate wildlife habitat education into existing and new streamway parks, greenways, etc.
- Continue public participation programs related to bird watching such as Eagle Days, the Kansas Winter Bird Feeder Survey, International Migratory Bird Day, and other birding events.
- Develop an effective wildlife viewing and appreciation program consisting of the "Watching Kansas Wildlife" viewing guide, a signing program for areas included in the guide, and the promotion of special events, festivals, nature tourism, and citizen science programs.
- Develop agreements and capabilities for more canoeing trails.
- Provide "read-only," user-friendly electronic access to wildlife viewing areas data layer via a geographic information system, and natural history information.
- Use the Kansas Nature-based Tourism Alliance for guidance, promotion and projects.
- Provide direction so that more positive snake education and appreciation can be realized as a result of existing rattlesnake roundup(s).
- Identify programs that educate parents and families to establish communication links between families and programs.

Issue:

▶ Many educators lack the understanding or the resources to be able to cooperate with nongame programs.

Strategies:

- Enhance the development of wildlife teaching materials and programs from K-College for administrators, teacher trainers, and teachers that help link environmental literacy components to existing curriculum standards. This would include teacher workshops on wildlife diversity, with credit for re-certification.
- Supply resources to help expand conservation education workshops for teachers and youth leaders including efforts with Project Wild, Project Aquatic, Project Wet, and Project Learning Tree. Consider week-long workshops for teacher credit.
- Expand workshops for all wildlife and their conservation needs.

- Expand public outdoor skills workshops similar to the current Becoming an Outdoors Woman. Examples would be a workshop designed for teachers which could rotate among various universities along with specialized workshops for birding and wildlife photography.
- Develop materials and assist universities in the development of curriculum improvements for natural resource professionals. This could include professional training by universities for wildlife professionals.
- Consider assisting with maintenance of university natural history reservations.
- Ensure that reptiles, amphibians, insects, mussels and other non-traditional species information is available, and is incorporated into educational material.
- Design and fund nongame displays -- promote aquariums in classrooms as an example.
- Expand and improve Ecomeets, the Outdoor Wildlife Learning Sites Program, Envirothon, organization field trips, StreamLink, etc.
- Enhance educational efforts and materials for all taxa with emphasis to underexposed species groups.
- Provide educator incentives which facilitate wildlife education—for instance, educator grants.

Issue:

► Urban areas represent significant opportunities to build understanding and support for nongame programs.

Strategies:

- Acquire more sites near urban areas to provide additional programs through landowner-friendly methods.
- Target wildlife education and appreciation programs for specific urban audiences such as the Asian community with regard to implications of watercress harvest on Arkansas darter, *Etheostoma cragini*, populations.
- Provide educational materials and training via the Backyard Wildlife Habitat Improvement Program.

Issue:

► The lack of educational materials inhibits the ability to deliver nongame programs.

Strategies:

- Develop more nature, wildlife, and endangered species brochures, trading cards, posters and other materials, stressing educational programs and information on the importance of nongame habitat, enhancing the awareness and appreciation of little-known or misunderstood nongame species.
- Develop wildlife husbandry and other biological informational brochures to deal with the keeping of native amphibians, reptiles, and fish.
- Develop and implement standard protocol for atlas programs for native aquatic species, amphibians, reptiles, bats, butterflies, shorebirds, colonial nesting waterbirds, small mammals, and grassland birds.
- Develop interpretive guides and informational material to increase awareness and appreciation of all native species.
- Develop outreach interpretive programs for Kansas angler organizations, bait dealers, commercial fish growers, county and state engineers, and developers to promote appreciation of native fishes.

- Create education programs to allay public concerns over possible wetland negative impacts (West Nile Virus, blackbirds, etc).
- Develop an educational web page and other educational materials about Kansas invertebrates.
- Develop materials that link healthy wildlife populations with watershed best management practices.
- Provide educational materials related to aquatic nuisance species and other invasive species.

Issue:

▶ Lack of collaboration with established programs reduces the efficiency and effectiveness of nongame programs.

Strategies:

- Collaborate with outdoor educational and recreational programs of organizations and agencies.
- Support trail organizations to promote wildlife viewing and educational efforts.
- Cooperate with land management groups and inform them about wildlife conservation needs and values.
- Work with community-based organizations to foster citizen interest in habitat conservation.
- Encourage more activities by Department of Wildlife and Parks with groups such as the Kansas Herpetological Society and zoos.
- Continue participation in the Monarch Watch Program.

Issue:

▶ Significant opportunities exist for greater use of the media in developing understanding and support of nongame wildlife.

Strategies:

- Develop additional videos for education and appreciation of wildlife; making wildlife and environmental education video programs available to public television and cable/community channels throughout Kansas.
- Develop additional promotions of wildlife involving photographic and art contests.
- Continue presentations and exhibits at fairs, boat shows, garden shows, etc.

Issue:

▶ Significant opportunities exist for nongame programs supported by landowners/ managers and other initiatives.

Strategies:

- Redevelop and implement tax credit and conservation easement programs.
- Provide economic incentives to landowners for habitat conservation (both terrestrial and aquatic) efforts.
- Provide information on best management practices for wildlife habitat.
- Provide cost-share grants to communities and organizations for stimulating nature-based tourism consistent with conservation objectives.
- Promote donations of wildlife areas through Wildtrust, Kansas Wildscape Foundation, and other entities.

ECOLOGICAL FRAMEWORK

For purposes of this Comprehensive Wildlife Conservation Plan, the Kansas Department of Wildlife and Parks has divided the state into three Conservation Regions; the Shortgrass Prairie Conservation Region, the Central Mixed Grass Conservation Region, and the Eastern Tallgrass Conservation Region. These regions can be seen in Figure 2: Kansas CWCP Conservation Regions.

This approach utilizes the ecological region framework developed by the North American Bird Conservation Initiative and refined by the Playa Lakes Joint Venture, both to serve the internal needs of the Kansas Department of Wildlife and Parks and to ensure compatibility with approaches being used by other agencies to facilitate joint projects.

The Shortgrass Prairie Conservation Region is located in the western third of Kansas, and includes the counties of Cheyenne, Sherman, Thomas, Rawlins, Wallace, Logan, Gove, Ness, Greeley, Wichita, Scott, Lane, Hamilton, Kearney, Finney, Gray, Stanton, Grant, Haskell, Morton, Stevens, Seward, and Meade.

The Central Mixed Grass Prairie Conservation Region is located in the central part of Kansas, and includes all or part of the counties of Rawlins, Decatur, Norton, Phillips, Smith, Jewell, Republic, Washington, Marshall, Thomas, Sheridan, Graham, Rooks, Osborne, Mitchell, Cloud, Clay, Riley, Gove, Trego, Ellis, Russell, Lincoln, Ottawa, Dickinson, Saline, Ellsworth, Barton, Rush, Ness, Lane, Finney, Hodgeman, Pawnee, Stafford, Rice, McPherson, Marion, Butler, Harvey, Reno, Pratt, Kiowa, Edwards, Ford, Gray, Kingman, Sedgwick, Sumner, Barber, Comanche, Clark, Meade, Harper and Cowley. This is the transition area between the Shortgrass Prairie Conservation Region to the west and the Eastern Tallgrass Prairie Conservation Region to the east.

The Eastern Tallgrass Prairie Conservation Region is located in the eastern third of Kansas, and includes all or part of the counties of Marshall, Brown, Doniphan, Leavenworth, Wyandotte, Atchison, Jackson, Pottawatomie, Riley, Clay, Dickinson, Geary, Morris, Wabaunsee, Shawnee, Jefferson, Johnson, Miami, Franklin, Osage, Lyon, Chase, Marion, Butler, Harvey, Greenwood, Woodson, Coffey, Anderson, Linn, Allen, Douglas, Elk, Butler, Cowley, Wilson, Neosho, Bourbon, Crawford, Cherokee, Labette, Montgomery, Chautauqua and Cowley.

Shortgrass Prairie Conservation Region

The Shortgrass Prairie Conservation Region is located in the western third of Kansas. It is primarily the High Plains and a portion of Arkansas River Lowlands physiographic regions. The Shortgrass Prairie Conservation Region is in the rain shadow of the Rocky Mountains, receiving only between 10-20 inches of rain annually. This semi-arid land supports limited plant growth. Shortgrass Prairie and Sandsage Shrubland Habitats are the primary habitats within this conservation region. However, Herbaceous Wetlands (playa lakes), Deciduous Floodplains, surface water (lotic and lentic) and Riparian Shrubland, are important to the biodiversity to the conservation region, and the last four can be considered together as the riparian corridor complex for this section. Livestock grazing, row crop farming, fire and climate are the factors that have the primary influence on this conservation region.

The habitats for the Shortgrass Prairie Conservation Region are listed in general priority order. The key habitats are identified with an asterisk (*).

Shortgrass Prairie *
Sandsage Shrubland*
Herbaceous Wetland*
Deciduous Floodplain*
Aquatic-western lentic (still waters)*
Aquatic- western lotic (flowing waters)*
Riparian Shrubland*
Mixed Prairie
CRP/Native
CRP/Introduced Grass
Cropland
Urban Areas
Seeps and Springs

Shortgrass Prairie Habitat

The relative quality of the Shortgrass Prairie Habitat is unknown and the relative quantity of the habitat is stable. It is the predominant habitat type in the Shortgrass Prairie Conservation Region. The dominant grass species in the Shortgrass Prairie Habitat are:

buffalo grass (*Buchloe dactyloides*)
blue grama grass *(Bouteloua gracilis*)
western wheatgrass (*Pascopyrum smithii*).

The Species of Greatest Conservation Need for the Shortgrass Prairie Habitat are listed on Table 1. They are ranked into tiers. This process is shown in detail in Appendix 1 "Kansas' Species of Greatest Conservation Need – Selection and Ranking". This ranking established a baseline against which future evaluations and monitoring can be compared, on a species basis. It will also be used to prioritize research and survey proposals.

Table 1. Shortgrass Prairie Conservation Region
Shortgrass Prairie Habitat
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Birds	Ferruginous Hawk	*Buteo regalis*	14	I
Mammals	Black-tailed Prairie Dog	*Cynomys ludovicianus*	14	I
Birds	Lesser Prairie-Chicken	*Tympanuchus pallidicinctus*	14	I
Birds	Mountain Plover	*Charadrius montanus*	14	I
Birds	Loggerhead Shrike	*Lanius ludovicianus*	13	I
Birds	Long-billed Curlew	*Numenius americanus*	13	I
Birds	Sprague's Pipit	*Anthus spragueii*	12	I
Birds	Burrowing Owl	*Athene cunicularia*	12	I
Birds	Golden Eagle	*Aquila chrysaetos*	12	I
Mammals	Spotted Skunk (T)	*Spilogale putorius*	12	I
Mammals	Black-footed Ferret (E) (X)	*Mustela nigripes*	12	I
Birds	Chihuahuan Raven	*Corvus cryptoleucus*	12	I
Birds	Greater Prairie-Chicken	*Tympanuchus cupido*	12	I
Birds	Short-eared Owl	*Asio flammeus*	11	I
Birds	Common Poorwill	*Phalaenoptilus nuttallii*	11	I
Birds	Cassin's Sparrow	*Aimophila cassinii*	11	I
Birds	Ladder-backed Wodpecker	*Piciodes scalaris*	11	I
Birds	Chestnut-collared Longspur	*Calcarius ornatus*	11	I
Reptiles	Lesser Earless Lizard	*Holbrookia maculata*	11	I
Birds	Swainson's Hawk	*Buteo swainsoni*	11	I
Reptiles	Checkered Garter Snake (T)	*Thamnophis marcianus*	11	I
Birds	McCown's Longspur	*Calcarius mccownii*	11	I
Birds	Upland Sandpiper	*Bartramia longicauda*	10	II
Birds	Common Nighthawk	*Chordeiles minor*	10	II
Mammals	Swift Fox	*Vulpes velox*	10	II
Mammals	Spotted Ground Squirrel	*Spermophilus spilosoma*	10	II
Reptiles	Texas Horned Lizard	*Phrynosoma cornutum*	10	II
Reptiles	Eastern Hognose Snake	*Heterodon platirhinos*	10	II
Reptiles	Western Hognose Snake	*Heterodon nasicus*	10	II
Birds	Scissor-tailed Flycatcher	*Tyrannus forficatus*	10	II
Birds	Lark Sparrow	*Chondestes grammacus*	10	II
Birds	Lark Bunting	*Calamospiza melanocorys*	10	II
Birds	Grasshopper Sparrow	*Ammodramus savannarum*	10	II
Birds	Brown Thrasher	*Toxostoma rufum*	10	II
Amphibians	Green Toad (T)	*Bufo debilis*	10	II
Birds	Northern Bobwhite	*Colinus virginianus*	9	III
Birds	Western Kingbird	*Tyrannus verticalis*	9	III

Table 1. Shortgrass Prairie Conservation Region
Shortgrass Prairie Habitat
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Reptiles	Eastern Glossy Snake	*Arizona elegans*	9	III
Reptiles	Longnose Snake (T)	*Rhinocheilus lecontei*	9	III
Reptiles	Ground Snake	*Sonora semiannulata*	9	III
Reptiles	Common Garter Snake	*Thamnophis sirtalis annectens*	9	III
Mammals	Yellow-faced Pocket Gopher	*Cratogeomys castanops*	9	III
Reptiles	Texas Blind Snake (T)	*Leptotyphlops dulcis*	9	III
Birds	Scaled Quail	*Callipepla squamata*	8	III
Reptiles	Prairie Rattlesnake	*Crotalus viridis*	8	III

(T) means State Threatened (Federal threatened are included)
(E) means State Endangered (Federal endangered are included)
(X) means extirpated

Issues and Strategies: for the Shortgrass Prairie Habitat

The issues, with their accompanying strategies, are listed in general priority order.

Issues:

Land Management Systems: The intensification of agriculture, particularly grazing, cotton production, and the practice of wheat stubble burning, is having major impacts on the heterogeneity of the Shortgrass Prairie Habitat.

- There is a lack of basic knowledge concerning management practices that will benefit (long-term and short-term) both the landowner and wildlife.
- There is a lack of utilization of good management practices.
- There is insufficient financial and public support for Shortgrass Prairie conservation.

Strategies:

- Develop a broad scale education approach and outreach programs about the value of wildlife and the use of agricultural best management practices. These programs would be designed to effectively communicate with various publics: landowners, managers, local governments, agricultural industries, and the general public.
- Implement research on techniques to increase the heterogeneity of the Shortgrass Prairie Habitat.
- Research no-till impacts on wildlife habitat.
- Conduct research to understand the economics related to land use changes and use that information to develop incentive programs for landowners and managers to promote heterogeneity and diversity.
- Develop conceptual new programs or modify existing incentive programs for private lands that are “wildlife friendly” and compatible with agriculture.
- Provide incentives to landowners to reduce intensified agricultural practices.
- Develop better coordination of government programs.
- Develop cost-neutral/positive conservation practices for producers to provide for maintenance of viable farming/ranching operations.

- Develop and implement methods to offset economic practices (wind farms, farm programs that encourage overproduction, conversion of unsuitable lands into production, urbanization) that have negative environmental impacts.

Issues:

Fragmentation and Grassland Conversion: In the Shortgrass Prairie, agriculture practices are the primary reasons for fragmentation and conversion.

- Fragmentation serves as a barrier to species migration and movement.
- Grassland conversion to other uses allows non-native plants to become established.
- There is a lack of knowledge and understanding about the impacts of fragmentation and grassland conversion on flora and fauna.
- Livestock and grain prices can cause major changes on the rate of conversion of native grassland.

Strategies:

- Develop a broad scale education approach and outreach program about the use of best management practices in agriculture. These programs would be designed to effectively communicate with various publics: landowners, managers, local governments, and the agricultural industries.
- Develop a broad scale education approach and outreach program on the impacts of fragmentation and conversion of land use on wildlife. These programs would be designed to effectively communicate with various publics: landowners, managers, local governments, agricultural industries, and the general public.
- Research effects of habitat fragmentation.
- Conduct research to develop best management practices, and provide the results to other agencies and landowners/mangers.
- Assess habitat fragmentation and its impacts on the natural community through GAP analysis.
- Use conservation easements to prevent further fragmentation.
- Maintain and create wildlife corridors and refuges to reduce impacts of habitat fragmentation.
- Promote field border programs and county road easements which are landowner and wildlife friendly.
- Conduct research on the impacts of fragmentation size and matrix configuration on wildlife.
- Monitor wind farming for habitat fragmentation.
- Provide landowners incentives for maintaining grassland.
- Acquire key parcels of land on a willing seller basis.
- Reduce grazing impacts by designing and encouraging implementation of wildlife friendly grazing systems, drought management plans, and conservation payment systems.
- Use CRP as a Grassbank to allow recovery of native range.
- Develop methods to increase range plant diversity.
- Work with other state agencies, such as the Kansas Department of Transportation, to avoid, minimize, reduce and mitigate impacts to habitat resulting from their programs.

- Acquire corridors on a willing seller basis, and consider habitat fragmentation in acquisition plans.
- Develop staffing and strategies to address mushrooming conservation planning needs for multi-state species such as black-tailed prairie dog, swift fox, lesser prairie chicken, mountain plover, and additional specific conservation planning.

Issues:

The black tailed prairie dog (*Cynomys ludovicianus*) population is currently low compared to historical range and population and under continual threats due to eradication programs, disease and other factors.

- ▶ The loss of habitat due to fragmentation and conversion to cropland is having a negative impact on the population.
- ▶ Black-tailed prairie dog management activities on private land are having a negative impact on the population.
- ▶ There is a lack of knowledge and understanding about the black-tailed prairie dog and its role in the Shortgrass Prairie.
- ▶ The sylvatic plague is having a negative impact on the population.

Strategies:

- Develop a broad scale education approach and outreach program for the black-tailed prairie dog. These programs would be designed to effectively communicate with various publics: landowners, managers, local governments, agricultural industries, and the general public.
- Develop effective information and educational materials about the black-tailed prairie dog.
- Develop and implement a Black-tailed Prairie Dog Management Plan.
- Provide education about the black-tailed prairie dog as a "keystone species".
- Continue to conduct population surveys of the black-tailed prairie dog.
- Gather information to understand the distribution pattern of the sylvatic plague.
- Acquire conservation easements and develop other landowner incentive programs for the black-tailed prairie dog as advisable and possible.
- Discourage mandatory black-tailed prairie dog management on private lands.

Issue:

- ▶ There is a lack of data on species present, and habitat needs.

Strategies:

- Conduct wildlife surveys.
- Conduct studies of habitat needs of species that inhabit the area.
- Conduct studies on habitat quality and quantity.

Monitoring for the Shortgrass Prairie Habitat:

- ♦ Implement attitude/knowledge surveys of landowners, managers, local governments, agricultural industries, and the general public and repeat periodically.
- ♦ Monitor the numbers of acres and participants enrolled in various programs (Conservation Reserve Program, Grassbank, etc.).
- ♦ Monitor the number of acres which conserve shortgrass prairie.
- ♦ Monitor the number of new programs being implemented.

- ♦ Identify the number of acres of native habitat and monitor periodically.
- ♦ Use GIS to monitor current status and change over time.
- ♦ Identify the number of better management practices developed and implemented and monitor periodically.
- ♦ Monitor the education materials developed and distributed.
- ♦ Monitor the number of promotional products and their distribution.
- ♦ Monitor the number of audiences reached.
- ♦ Identify the number of acres in conservation easements and contracts and monitor periodically.
- ♦ Monitor the number of counties involved in conservation easements and contracts.
- ♦ Develop an annual implementation report.
- ♦ Periodic surveys are preferred every 5 years - essential every 10 years.

Sandsage Shrubland

The Sandsage Shrubland Habitat is declining both in quality and quantity. This habitat is located primarily in the southwestern portion of Kansas. Sandsage (*Artemisia filifolia*) and grasses such as sand bluestem (*Andropogon hallii*) and sandreed grass (*Calamovilfa longifolia*) are dominant in the Sandsage Shrubland Habitat.

The Species of Greatest Conservation Need for the Sandsage Shrubland Habitat are listed on Table 2. They are ranked into tiers. This process is shown in detail in Appendix 1 "Kansas' Species of Greatest Conservation Need – Selection and Ranking". This ranking established a baseline against which future evaluations and monitoring can be compared, on a species basis. It will also be used to prioritize research and survey proposals.

Table 2. Shortgrass Prairie Conservation Region
Sandsage Shrubland Habitat
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Birds	Lesser Prairie-Chicken	*Tympanuchus pallidicinctus*	14	I
Mammals	Black-tailed Prairie Dog	*Cynomys ludovicianus*	14	I
Birds	Ferruginous Hawk	*Buteo regalis*	14	I
Birds	Loggerhead Shrike	*Lanius ludovicianus*	13	I
Birds	Chihuahuan Raven	*Corvus cryptoleucus*	12	I
Mammals	Black-footed Ferret (E) (X)	*Mustela nigripes*	12	I
Birds	Burrowing Owl	*Athene cunicularia*	12	I
Birds	Peregrine Falcon (E)	*Falco peregrinus*	12	I
Birds	Greater Prairie-Chicken	*Tympanuchus cupido*	12	I
Birds	Curve-billed Thrasher	*Toxostoma curcirostre*	11	I
Birds	Cassin's Sparrow	*Aimophila cassinii*	11	I
Birds	Short-eared Owl	*Asio flammeus*	11	I
Birds	Common Poorwill	*Phalaenoptilus nuttallii*	11	I
Reptiles	Lesser Earless Lizard	*Holbrookia maculata*	11	I

Table 2. Shortgrass Prairie Conservation Region
Sandsage Shrubland Habitat
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Birds	Ladder-backed Wodpecker	*Piciodes scalaris*	11	I
Birds	Swainson's Hawk	*Buteo swainsoni*	11	I
Reptiles	Checkered Garter Snake (T)	*Thamnophis marcianus*	11	I
Mammals	Spotted Ground Squirrel	*Spermophilus spilosoma*	10	II
Birds	Common Nighthawk	*Chordeiles minor*	10	II
Birds	Upland Sandpiper	*Bartramia longicauda*	10	II
Birds	Bullock's Oriole	*Icterus bullockii*	10	II
Reptiles	Eastern Hognose Snake	*Heterodon platirhinos*	10	II
Reptiles	Western Hognose Snake	*Heterodon nasicus*	10	II
Reptiles	Texas Horned Lizard	*Phrynosoma cornutum*	10	II
Birds	Lark Sparrow	*Chondestes grammacus*	10	II
Birds	Lark Bunting	*Calamospiza melanocorys*	10	II
Birds	Scissor-tailed Flycatcher	*Tyrannus forficatus*	10	II
Birds	Northern Bobwhite	*Colinus virginianus*	9	III
Insect	Monarch	*Danaus plexippus*	9	III
Birds	Western Kingbird	*Tyrannus verticalis*	9	III
Birds	Mississippi Kite	*Ictinia mississippiensis*	9	III
Birds	Red-headed Woodpecker	*Melanerpes erythrocephalus*	9	III
Reptiles	Eastern Glossy Snake	*Arizona elegans*	9	III
Reptiles	Longnose Snake (T)	*Rhinocheilus lecontei*	9	III
Reptiles	Common Garter Snake	*Thamnophis sirtalis annectens*	9	III
Reptiles	Prairie Rattlesnake	*Crotalus viridis*	8	III
Reptiles	Milk Snake	*Lampropeltis triangulum*	8	III
Birds	Scaled Quail	*Callipepla squamata*	8	III

(T) means State Threatened (Federal threatened are included)
(E) means State Endangered (Federal endangered are included)
(X) means extirpated

Issues and Strategies: for the Sandsage Shrubland Habitat

The issues, with their accompanying strategies, are listed in general priority order.

Issues:

Fragmentation and Grassland Conversion: In the Sandsage Shrubland Habitat, agriculture practices are the primary reasons for fragmentation and land use conversion.

- Fragmentation serves as a barrier to species migration and movement.
- Grassland conversion allows non-native plants to become established.
- There is a lack of knowledge and understanding about the impacts of fragmentation and grassland conversion on flora and fauna.
- Livestock and grain prices can cause major changes on the rate of conversion of native grassland.

Strategies:

- Develop broad scale education approach and outreach programs about the use of best management practices in agriculture. These programs would be designed to

effectively communicate with various publics: landowners, managers, local governments, and the agricultural industries.

- Develop a broad scale education approach and outreach program on the impacts of fragmentation and land use conversion on wildlife. These programs would be designed to effectively communicate with various publics: landowners, managers, local governments, agricultural industries, and the general public
- Conduct research on the impacts of fragmentation size and matrix configuration on wildlife.
- Conduct research to develop best management practices, and share the results with other agencies and landowners/managers.
- Assess habitat fragmentation and its impacts on the natural community through GAP analysis.
- Research effects of habitat fragmentation.
- Monitor wind farming for habitat fragmentation.
- Maintain and create wildlife corridors and refuges.
- Promote field border programs and county road easements.
- Provide landowners incentives for not converting grassland to cropland, and for converting croplands back to grasslands.
- Acquire key parcels of land through willing sellers.
- Reduce grazing impacts by designing proper grazing systems, drought management plans, and conservation payment systems.
- Use the Conservation Reserve Program as a Grassbank to allow recovery of native range.
- Use conservation easements to prevent further fragmentation.
- Develop methods to increase range plant diversity.
- Work with other state agencies to reduce impacts to habitat resulting from their programs.
- Acquire corridors, and consider habitat fragmentation in acquisition plans on a willing seller basis.
- Maintain field corners for wildlife habitat.

<u>Issues:</u>

Land Management Systems: The intensification of agriculture, particularly grazing, cotton production, and the practice of wheat stubble burning are having major impacts on the heterogeneity of the Sandsage Shrubland Habitat.

- ▶ There is a lack of basic knowledge and application of good management practices.
- ▶ Known recommended management practices are not always employed.
- ▶ There is insufficient financial and public support for Sandsage Shrubland conservation.

<u>Strategies:</u>

- Develop a broad scale education approach and outreach program on the value of wildlife and the use of agricultural best management practices. These programs would be designed to effectively communicate with various publics: landowners, managers, local governments, agricultural industries, and the general public.

- Implement research on techniques to increase the heterogeneity of the Sandsage Shrubland Habitat.
- Research no-till impacts on wildlife habitat.
- Conduct research to understand the economics related to land use changes. Use that information to develop incentive programs for landowners and managers to promote heterogeneity and diversity.
- Develop new programs or modify existing incentive programs for private lands to be "wildlife friendly" and compatible with agriculture.
- Provide incentives to landowners to reduce intensified agricultural practices.
- Develop better coordination of government programs.
- Develop cost-neutral/positive conservation practices for producers to provide for maintenance of viable farming/ranching operations.
- Develop and implement methods to offset economic practices that have negative environmental impacts such as wind farms, farm programs that encourage overproduction and conversion of unsuitable lands into production, and urbanization.

Issues:

Restoration of Sandsage Shrubland Habitat:

- ▶ Loss of Sandsage Shrubland Habitat is continuing due to dewatering , lowering of water tables and land conversion.

Strategies:

- Conduct research on ways to improve effectiveness and efficiency of irrigation practices.
- Research methods to control and manage sagebrush, instead of its elimination.
- Develop a restoration plan that identifies mitigation opportunities and funding sources.
- Develop potential seed sources and establish experimental plots for native plant species.
- Purchase or retire water rights.
- Develop new programs or modify existing incentive programs for private lands to be "wildlife friendly" and compatible with agriculture.
- Provide incentives to landowners to restore native habitat.
- Develop better coordination of government programs.
- Develop cost-neutral/positive conservation practices for producers to provide for the maintenance of viable farming/ranching operations.
- Develop and implement methods to offset economic practices that have negative environmental impacts, such as wind farms, farm programs that encourage overproduction, conversion of unsuitable lands into production, and urbanization.
- Determine dewatering impacts on aquatic wildlife and wetlands.
- Promote improved water quality standards and minimum desirable stream flows.

Issue:

Lesser Prairie Chicken, *Tympanuchus pallidicinctus:*

- ▶ The lesser prairie chicken population is low and declining due to habitat loss, fragmentation and natural mortality.

Strategies:

- Develop broad scale education approach and outreach programs about the value of the lesser prairie chicken and promote lesser prairie chicken viewing on private properties.
- Publish and distribute publications on lesser prairie chicken management (similar to Oklahoma).
- Promote the lesser prairie chicken as an indicator species.
- Research and address wind farm impacts on lesser prairie chicken.
- Continue lesser prairie chicken surveys.
- Bury or route power lines around nesting, brood rearing and lek habitats.
- Acquire, as advisable and possible, conservation easements on critical habitat with protocols for non-impact.

Issue:

Exotic and Invasive Species:

▶ Exotic and invasive species are having a negative impact on the native flora and fauna of the Sandsage Shrubland Habitat.

Strategies:

- Develop broad scale education approach and outreach programs on the impacts of exotic and invasive species. These programs would be designed to effectively communicate with various publics: landowners, managers, local government, agricultural industries, and the general public.
- Conduct research to better understand the actual threats of exotic and invasive species and develop best management practices.
- Develop an integrated exotic and invasive species management program.
- Implement programs to minimize disturbance of public and private lands, including roads and trails.

Issue:

▶ There is a lack of data on species present, and habitat needs.

Strategies:

- Conduct wildlife surveys.
- Conduct studies of habitat needs of species that inhabit the area.
- Conduct studies on habitat quality and quantity.

Monitoring for the Sandsage Shrubland Habitat:

♦ Monitor the acres mitigated.
♦ Identify the plans developed and ready to implement.
♦ KDWP ENV monitor and promote siting guidelines.
♦ Publish and distribute an Integrated Pest Management report.
♦ Measure new trails.
♦ Population surveys of exotics and invasive species.
♦ Implement attitude/knowledge surveys of landowners, managers, local governments, agricultural industries, and the general public and repeat periodically.
♦ Monitor the numbers of acres and participants enrolled in various programs (Conservation Reserve Program, Grassbank, etc.).

- Monitor the number of acres acquired that conserve these habitats.
- Monitor the number of new programs being implemented.
- Identify the number of acres of native habitat and monitor periodically.
- Use of GIS to monitor current status and changes over time.
- Identify the number of better management practices developed and implemented and monitor periodically.
- Monitor the education materials developed and distributed.
- Monitor the audience reached by various partners.
- Monitor the numbers of promotional products and distribution.
- Identify the number of acres in conservation easements and contracts and monitor periodically.
- Monitor the number of counties involved.
- Develop an annual implementation report.
- Periodic surveys are preferred every 5 years - essential every 10 years.

Herbaceous Wetlands (Playa) Habitat

The Herbaceous Wetland Habitat in the Shortgrass Prairie Conservation Region is comprised of the Kansas-GAP Wetland Alliances of:

Playa Lake *Polygonum* spp. - *Echinochloa* spp.
Low or Wet Prairie *Spartina pectinata*
Freshwater Marsh *Typha* spp. - (*Scirpus* spp., *Juncus* spp.)
Bulrush Marsh *Scirpus pungens* Semipermanently Forb
Playa Lake *Heteranthera limosa*

The quality of Herbaceous Wetland Habitat is unknown and the quantity trend is declining. Playa Lakes are the predominant herbaceous wetlands of the Shortgrass Prairie Conservation Region. Playa lakes are shallow, clay-lined, ephemeral wetlands. Because rainfall is the only source of water, playa lakes go through a wet-dry cycle each year.

Humans have major impacts on Playa Lakes. Plowing, drainage, livestock watering, and irrigation have altered them. They have been polluted by sedimentation and runoff of fertilizers and pesticides.

The Species of Greatest Conservation Need for the Herbaceous Wetland Habitat are listed on Table 3. They are ranked into tiers. This process is shown in detail in Appendix 1 “Kansas’ Species of Greatest Conservation Need – Selection and Ranking”. This ranking established a baseline against which future evaluations and monitoring can be compared, on a species basis. It will also be used to prioritize research and survey proposals.

Table 3. Shortgrass Prairie Conservation Region
Herbaceous Wetland Habitat
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Birds	Snowy Plover (T)	*Charadrius alexandrinus*	14	I
Birds	Baird's Sparrow	*Ammodramus bairdii*	13	I
Birds	Hudsonian Godwit	*Limosa haemastica*	13	I
Birds	Rusty Blackbird	*Euphagus carolinus*	13	I
Birds	Long-billed Curlew	*Numenius americanus*	13	I
Birds	Black-bellied Plover	*Pluvialis squatarola*	12	I
Birds	Stilt Sandpiper	*Calidris himantopus*	12	I
Birds	Least Tern (E)	*Sterna antillarum*	12	I
Birds	Black-billed Cuckoo	*Coccyzus erythropthalmus*	12	I
Birds	Peregrine Falcon (E)	*Falco peregrinus*	12	I
Birds	Whooping Crane (E)	*Grus americana*	12	I
Birds	Piping Plover (T)	*Charadrius melodius*	12	I
Birds	Black Tern	*Chlidonias niger*	11	I
Birds	Long-billed Dowitcher	*Limnodromus scolopaceus*	11	I
Mammals	Southern Bog Lemming	*Synaptomys cooperi*	11	I
Birds	American Golden-Plover	*Pluvialis dominica*	11	I
Birds	Pectoral Sandpiper	*Calidris melanotos*	11	I
Birds	Swainson's Hawk	*Buteo swainsoni*	11	I
Birds	Black-crowned Night-Heron	*Nycticorax nycticorax*	11	I
Birds	Forster's Tern	*Sterna forsteri*	11	I
Birds	Short-eared Owl	*Asio flammeus*	11	I
Birds	Least Bittern	*Ixobrychus exilis*	11	I
Birds	Brewer's Blackbird	*Euphagus cyanocephalus*	11	I
Birds	Little Blue Heron	*Egretta caerulea*	11	I
Reptiles	Checkered Garter Snake (T)	*Thamnophis marcianus*	11	I
Birds	Bald Eagle (T)	*Haliaeetus leucocephalus*	10	II
Birds	American Bittern	*Botaurus lentiginosus*	10	II
Birds	Great Egret	*Ardea alba*	10	II
Birds	Northern Pintail	*Anas acuta*	10	II
Birds	Lesser Yellowlegs	*Tringa flavipes*	10	II
Amphibians	Green Toad (T)	*Bufo debilis*	10	II
Birds	Eastern Meadowlark	*Sturnella magna*	10	II
Birds	Greater Yellowlegs	*Tringa melanoleuca*	10	II
Birds	American Avocet	*Recurvirostra americana*	10	II
Birds	Least Sandpiper	*Calidris minutilla*	10	II
Amphibians	Northern Cricket Frog	*Acris crepitans*	10	II
Birds	Baird's Sandpiper	*Calidris bairdii*	10	II
Birds	Upland Sandpiper	*Bartramia longicauda*	10	II
Birds	Semipalmated Sandpiper	*Calidris pusilla*	9	III
Birds	Wilson's Phalarope	*Phalaropus tricolor*	9	III
Birds	Mississippi Kite	*Ictinia mississippiensis*	9	III
Birds	White-rumped Sandpiper	*Calidris fuscicollis*	9	III
Reptiles	Common Garter Snake	*Thamnophis sirtalis annectens*	9	III
Birds	American White Pelican	*Pelecanus erythrorhynchos*	9	III

Table 3. Shortgrass Prairie Conservation Region Herbaceous Wetland Habitat Species of Greatest Conservation Need				
Group	**Common Name**	**Scientific Name**	**Total**	**Tier**
Birds	Eared Grebe	*Podiceps nigricollis*	9	III
Birds	Western Grebe	*Aechmophorus occidentalis*	9	III
Birds	Canvasback	*Aythya valisineria*	9	III

(T) means State Threatened (Federal threatened are included)
(E) means State Endangered (Federal endangered are included)
(X) means extirpated

Issues and Strategies: for the Herbaceous Wetland Habitat

The issues, with their accompanying strategies, are listed in general priority order.

Issue:
Land Management Systems:

- Agricultural practices such as draining, cultivation, degraded water quality from runoff, and sedimentation are having major impacts on playa basins.

Strategies:

- Develop a broad scale education approach and outreach program on the value of wildlife and the use of agricultural best management practices in playa basins. These programs would be designed to effectively communicate with various publics: landowners, managers, local governments, agricultural industries, and the general public.
- Implement research on techniques to increase the heterogeneity of the playa basins.
- Conduct research to understand the economics related to land use changes and use that information to develop incentive programs for landowners and managers to promote heterogeneity and diversity.
- Develop new programs or modify existing incentive programs for private lands to be "wildlife friendly" and compatible with agriculture.
- Provide incentives to landowners to reduce intensified agricultural practices.
- Develop better coordination of government programs.
- Develop cost-neutral/positive conservation practices for producers in order to provide for maintenance of viable farming/ranching operations.
- Develop and implement methods to offset economic practices that have negative environmental impacts, such as wind farms, farm programs that encourage overproduction, conversion of unsuitable lands into production, and urbanization.
- Research no-till impacts on wildlife habitat.

Issue:
Water Quantity:

- Utilization of water from Playa Lakes is having major impacts on the availability of surface water and is affecting the water table.

Strategies:

- Promote wildlife viewing opportunities on private lands, i.e. special events, festivals, nature tourism, and citizen science programs.

- Develop systems to monitor quantity of surface acres.
- Develop and implement watershed management plans.
- Develop cost-neutral/positive conservation practices for producers to provide for maintenance of viable farming/ranching operations.
- Investigate ways to determine water use (i.e., implement metering and have fees based upon amount used).
- Make sure there is adequate enforcement.
- Acquire water rights as advisable and possible.
- Change water rights laws so that a user is not required to pump their entire allocation to maintain their water rights.
- Encourage water right regulations which prevent water overappropriations.

Issue:

Water Quality:

▶ Agricultural practices around playa lakes are having negative impacts on the flora and fauna of the area.

Strategies:

- Develop a study to quantify effects of agricultural practices.
- Develop and implement watershed management plans.
- Develop a water quality-testing program.
- Work with local, state and federal agencies to reduce impacts to these areas from their programs, and evaluate progress.
- Promote improved water quality standards for ground water aquifers.
- Develop cost-neutral/positive conservation practices for producers to provide for the maintenance of viable farming/ranching operations.
- Develop new programs or modify existing incentive programs for private lands to be "wildlife friendly" and compatible with agriculture.
- Promote the use of buffers around playa lakes.

Issue:

▶ There is a lack of knowledge and understanding by the general public and by decision makers about the importance of playa lakes.

Strategies:

- Supply resources to help expand conservation education workshops for teachers and youth leaders, including efforts with Project Wild, Project Aquatic, Project Wet, and Project Learning Tree. Consider weeklong workshops for teacher credit.
- Promote wildlife viewing (e.g., Develop an effective wildlife viewing and appreciation program, utilize the Kansas Nature-based Tourism Alliance for promotion and projects).
- Enhance the development of wildlife teaching materials and programs from K-College for administrators, teacher trainers, and teachers that help link environmental literacy components to existing curriculum standards. This would include teacher workshops on wildlife diversity, with credit for re-certification.

Issue:

► Playa Lakes are in need of preservation.

Strategies:

- Develop an acquisition and easement program which is landowner friendly.

Issue:

► There is a lack of data on species present, and habitat needs.

Strategies:

- Conduct wildlife surveys.
- Conduct studies of habitat needs of species that inhabit the area.
- Conduct studies on habitat quality and quantity.

Monitoring for the Herbaceous Wetland Habitat:

- ♦ Identify and monitor the number of Playas Lakes purchased.
- ♦ Identify and monitor the number of acres in easement.
- ♦ Use GIS mapping as a tool to monitor change.
- ♦ Quantify education materials developed and distributed.
- ♦ Evaluate number of landowner/managers involved in programs
- ♦ Use Stream link and/or the Wetland Reserve Program participation to monitor changes.
- ♦ Identify and monitor the number of special projects.
- ♦ Annually publish a management plan progress report.

Riparian Corridor Complex

The relative quality and quantity of the components of this complex is declining. Riparian corridors provide an important edge effect and provide connecting travel corridors between fragmented habitats. Surface water in this region is mostly ephemeral in nature, due to the lowering of the water table, and surface and ground water withdrawal, unless augmented by human activities. Deciduous Floodplains and Riparian Shrubland in this region are dependent upon flows that are for the most part intermittent. Because flows are intermittent, aquatic habitats are somewhat ephemeral. Dominant plant species are:

Cottonwood (*Populus deltoides*)
Ulmus Americana
Celtis spp
Acer spp.
Salix spp.

The Species of Greatest Conservation Need for the Riparian Corridor Complex are listed in Table 4. They are ranked into tiers. This process is shown in detail in Appendix 1 "Kansas' Species of Greatest Conservation Need – Selection and Ranking." This ranking established a baseline against which future evaluations and monitoring can be compared, on a species basis. It will also be used to prioritize research and survey proposals.

Table 4. Shortgrass Prairie Conservation Region
Riparian Corridor Habitats
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total Score	Tier	Habitats			
					Deciduous Flood plain	Riparian Scrubland	Western Lentic	Western Lotic
Fish	Arkansas Darter (T)	*Etheostoma cragini*	14	I				X
Fish	Arkansas River Shiner (X) (E)	*Notropis girardi*	13	I				X
Birds	Barn Owl	*Tyto alba*	11	I	X			
Birds	Bell's Vireo	*Vireo bellii*	11	I	X	X		
Birds	Black-bellied Plover	*Pluvialis squatarola*	12	I			X	
Birds	Black-billed Cuckoo	*Coccyzus erythropthalmus*	12	I			X	
Birds	Black-crowned Night-Heron	*Nycticorax nycticorax*	11	I	X	X	X	X
Birds	Black-necked Stilt	*Himantopus mexicanus*	11	I	X		X	
Fish	Brassy Minnow	*Hybognathus hankinsoni*	12	I				X
Birds	Brewer's Blackbird	*Euphagus cyanocephalus*	11	I	X			
Reptiles	Checkered Garter Snake (T)	*Thamnophis marcianus*	11	I	X	X	X	X
Fish	Common Shiner	*Luxilus cornutus*	11	I				X
Mussels	Cylindrical Papershell	*Anodontoides ferussacianus*	12	I				X
Fish	Flathead Chub (T)	*Platygobio gracilis*	12	I				X
Birds	Forster's Tern	*Sterna forsteri*	11	I			X	X
Birds	Greater Prairie-Chicken	*Tympanuchus cupido*	12	I	X			
Birds	Hudsonian Godwit	*Limosa haemastica*	13	I			X	
Birds	Least Bittern	*Ixobrychus exilis*	11	I	X		X	
Birds	Least Tern (E)	*Sterna antillarum*	12	I			X	X
Reptiles	Lesser Earless Lizard	*Holbrookia maculata*	11	I		X		
Birds	Little Blue Heron	*Egretta caerulea*	11	I	X	X	X	X
Birds	Loggerhead Shrike	*Lanius ludovicianus*	13	I	X	X		
Birds	Long-billed Dowitcher	*Limnodromus scolopaceus*	11	I			X	X
Birds	Marbled Godwit	*Limosa fedoa*	12	I	X		X	
Fish	Northern Plains Killifish	*Fundulus kansae*	13	I				X
Birds	Pectoral Sandpiper	*Calidris melanotos*	11	I			X	X
Fish	Peppered Chub (E)	*Macrhyhopsis tetranema*	14	I			X	
Birds	Piping Plover (T)	*Charadrius melodius*	12	I			X	
Fish	Plains Minnow	*Hybognathus placitus*	13	I				X
Mussels	Pondhorn	*Uniomerus tetralasmus*	11	I			X	X
Fish	River Shiner	*Notropis blennius*	11	I				X
Birds	Rusty Blackbird	*Euphagus carolinus*	13	I	X			
Birds	Snowy Plover (T)	*Charadrius alexandrinus*	14	I			X	X
Mammals	Southern Bog Lemming	*Synaptomys cooperi*	11	I	X	X		
Mammals	Spotted Skunk (T)	*Spilogale putorius*	12	I	X	X		
Birds	Stilt Sandpiper	*Calidris himantopus*	12	I				X
Fish	Topeka Shiner (T)	*Notropis topeka*	14	I				X
Birds	American Avocet	*Recurvirostra americana*	10	II			X	
Birds	American Bittern	*Botaurus lentiginosus*	10	II	X		X	
Mammals	American Black Bear (X)	*Ursus americanus*	10	II	X			

Table 4. Shortgrass Prairie Conservation Region
Riparian Corridor Habitats
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total Score	Tier	Habitats			
					Deciduous Flood plain	Riparian Scrubland	Western Lentic	Western Lotic
Birds	Baird's Sandpiper	*Calidris bairdii*	10	II				X
Birds	Bald Eagle (T)	*Haliaeetus leucocephalus*	10	II	X		X	X
Birds	Baltimore Oriole	*Icterus galbula*	10	II	X	X		
Birds	Brown Thrasher	*Toxostoma rufum*	10	II	X	X		
Birds	Bullock's Oriole	*Icterus bullockii*	10	II	X			
Birds	Dickcissel	*Spiza americana*	10	II	X			
Reptiles	Eastern Hognose Snake	*Heterodon platirhinos*	10	II	X	X		
Birds	Eastern Wood-Pewee	*Contopus virens*	10	II	X			
Birds	Great Egret	*Ardea alba*	10	II	X		X	X
Birds	Greater Yellowlegs	*Tringa melanoleuca*	10	II	X		X	X
Amphibians	Green Toad (T)	*Bufo debilis*	10	II			X	
Birds	Lark Sparrow	*Chondestes grammacus*	10	II		X		
Birds	Least Sandpiper	*Calidris minutilla*	10	II				X
Birds	Lesser Yellowlegs	*Tringa flavipes*	10	II	X		X	X
Amphibians	Northern Cricket Frog	*Acris crepitans*	10	II	X		X	X
Birds	Northern Pintail	*Anas acuta*	10	II	X	X	X	X
Birds	Orchard Oriole	*Icterus spurius*	10	II	X	X		
Birds	Scissor-tailed Flycatcher	*Tyrannus forficatus*	10	II		X		
Birds	Spotted Towhee	*Pipilo maculatus*	10	II	X	X		
Reptiles	Texas Horned Lizard	*Phrynosoma cornutum*	10	II	X	X		
Birds	Upland Sandpiper	*Bartramia longicauda*	10	II	X			
Reptiles	Western Hognose Snake	*Heterodon nasicus*	10	II	X	X		
Fish	White Sucker	*Catostomus commersonii*	10	II			X	
Crustaceans	A Crayfish	*Orconectes neglectus*	9	III				X
Birds	American Tree Sparrow	*Spizella arborea*	9	III	X	X		
Birds	American White Pelican	*Pelecanus erythrorhynchos*	9	III			X	
Birds	Canvasback	*Aythya valisineria*	9	III			X	
Reptiles	Common Garter Snake	*Thamnophis sirtalis annectens*	9	III	X	X	X	X
Mammals	Common Gray Fox	*Urocyon cinereoargenteus*	8	III	X			
Birds	Eared Grebe	*Podiceps nigricollis*	9	III			X	
Reptiles	Eastern Glossy Snake	*Arizona elegans*	9	III	X	X		
Birds	Eastern Kingbird	*Tyrannus tyrannus*	9	III	X	X		
Birds	Field Sparrow	*Spizella pusilla*	9	III		X		
Mussels	Giant Floater	*Pyganodon grandis*	8	III			X	X
Reptiles	Ground Snake	*Sonora semiannulata*	9	III	X			
Birds	Harris' Sparrow	*Zonotrichia querula*	9	III	X	X		
Reptiles	Longnose Snake (T)	*Rhinocheilus lecontei*	9	III	X	X		
Reptiles	Milk Snake	*Lampropeltis triangulum*	8	III	X			
Birds	Mississippi Kite	*Ictinia mississippiensis*	9	III	X			

Table 4. Shortgrass Prairie Conservation Region
Riparian Corridor Habitats
Species of Greatest Conservation Need

					Habitats			
Group	**Common Name**	**Scientific Name**	**Total Score**	**Tier**	**Deciduous Flood plain**	**Riparian Scrubland**	**Western Lentic**	**Western Lotic**
Insect	Monarch	*Danaus plexippus*	9	III	X	X		
Birds	Northern Bobwhite	*Colinus virginianus*	9	III	X	X		
Fish	Orangethroat Darter	*Etheostoma spectabile*	8	III				X
Mussels	Pimpleback	*Quadrula pustulosa*	9	III				X
Reptiles	Prairie Rattlesnake	*Crotalus viridis*	8	III	X	X		
Birds	Red-headed Woodpecker	*Melanerpes erythrocephalus*	9	III	X			
Birds	Semipalmated Sandpiper	*Calidris pusilla*	9	III				X
Turtles	Smooth Softshell	*Apalone mutica*	9	III	X			X
Fish	Stonecat	*Noturus flavus*	8	III			X	X
Birds	Western Grebe	*Aechmophorus occidentalis*	9	III			X	
Birds	White-rumped Sandpiper	*Calidris fuscicollis*	9	III				X
Birds	Wilson's Phalarope	*Phalaropus tricolor*	9	III			X	X

(T) means State Threatened (Federal threatened are included)
(E) means State Endangered (Federal endangered are included)
(X) means extirpated

Issues and Strategies: for the Riparian Corridor Complex

The issues, with their accompanying strategies, are listed in general priority order.

Issues:

Water Quality and Quantity

- Runoff of pesticides and fertilizers has negative impacts on the flora and fauna of the Riparian corridor complex.
- The decline of the water table is having negative impacts.
- The use of surface water from rivers and streams for irrigation is lowering the water level, resulting in negative impacts on native flora and fauna.

Strategies:

- Monitor impacts to fisheries from pollution sources.
- Identify pollution problem areas and improve conditions detrimental to biodiversity and endangered species.
- Promote improved water quality standards and minimum desirable stream flows.
- Investigate contaminant effects on reptilian and amphibian populations.
- Promote sound water quality standards and their enforcement through education and continued coordination with the Kansas Department of Health and Environment, and relate the standards to stream ratings, dependent on the presence of rare fishes, unique assemblages, or high biodiversity.
- Acquire rare, critical and/or important habitats through willing sellers.
- Develop riparian buffers in order to improve fish habitats.

- Research and develop engineering techniques for effective river and stream management.
- Administer minimum desirable stream-flows.

Issues:

Man-caused alteration of the habitat:

- ▶ The Riparian Corridor Complex is being converted to agricultural uses; some are being plowed to the water's edge, others are negatively impacted by trampling during grazing.
- ▶ Structures that alter the water from its natural drainage and flow patterns are preventing water from returning to rivers and streams.
- ▶ Bank destabilization caused by man (e.g., construction of reservoirs, clear water releases below reservoirs, artificial flow regime, grazing and farming practices) and some resulting bank stabilization methods are negatively affecting riparian corridors.

Strategies:

- Develop and implement public information and education programs.
- Research and investigate best management practices.
- Encourage conservation easements.
- Work with the county zoning boards to implement good urban planning procedures.
- Develop greenways and wildlife corridors.
- Develop plots to demonstrate best management practices on public and private lands.
- Offer incentives to private landowners to preserve the riparian corridor.
- Promote ecologically sound techniques for flood control, erosion control, nonpoint source pollution control and bank stabilization, which will provide high habitat diversity, and determine engineering techniques for preventing monotypic habitats.

Issue:

- ▶ Pollution from point and non-point sources is having a negative impact on the flora and fauna.

Strategies:

- Investigate effects of pesticides/herbicides (unintended consequences) and develop management options.
- Promote ecologically sound techniques for flood control, erosion control, non-point source pollution control, and bank stabilization, which will provide high aquatic habitat diversity, and determine engineering techniques for preventing monotypic habitats.
- Encourage the use of fences where necessary to manage the corridor, and otherwise conduct proper grazing management.
- Develop riparian buffers to improve fish habitats.

Issues:

Water Problems:

- ▶ The decline of the water table is having negative impacts.
- ▶ The use of surface water from streams for irrigation is having a negative impact.

Strategies:

- Increase access/linking on Internet in rural areas and make information available on Internet, KDWP/NCRS/etc sites.
- Promote and encourage formation of coalitions/associations such as the Comanche Pool Prairie Resource Foundation.
- Acquire rare, critical and/or important habitats through willing sellers.
- Acquire water rights as advisable and possible.
- Acquire riparian corridor acreages through willing sellers.
- Research and develop engineering techniques for efficient management.
- Maximize habitat diversity for wildlife species.
- Work with neighboring states to gain compliance of interstate compacts in regard to water rights.
- Develop appropriate water use allocations and enforce them.
- Offer incentives to private landowners not to convert their lands to agriculture.
- Expand the Wetlands Reserve, and conservation easement programs.
- Develop programs to acquire more conservation easements as advisable and possible.
- Develop practices that provide benefits to landowners and to wildlife.
- Encourage ranchers to consider long term over short term benefits.
- Increase personnel in the field to expand the contacts between natural resource professionals and landowners.

Issue:

▶ The definition of riparian corridors as a wetland type is different for local governments, the state, and the federal government.

Strategies:

- Continue efforts for one common state, local, federal definition of wetlands.
- Form a coalition for support of national efforts to get an agreed-upon definition.

Issue:

▶ Funding for programs is limited.

Strategies:

- Educate the public about the value of wetlands, including riparian corridors, so they will support increased funding.
- Support eco-tourism efforts such as the Kansas Nature-based Tourism Alliance to promote values of wetlands and riparian corridors.
- Seek out ways to leverage existing funds and search out new funding sources.

Issue:

▶ The introduction of Asian clam and other introduced species has had negative impacts on native fish species and habitats.

Strategies:

- Educate the public regarding the importance of keeping invasive species out.
- The Kansas Dept. of Wildlife and Parks needs to develop a Sensitive Species Conservation Plan program.
- Study impact of Asian clam and other introduced species on native species.
- Prohibit importation of non-native fish.

- Develop"clean" list of species allowed in Kansas to complement the Lacy Act.
- Expand cooperative programs that supply technical and direct assistance for nuisance animal control problems and efforts.
- Develop plans to prevent the invasion of exotic fish such as round gobies, *Neogobius melanostomus*, European ruffe, *Gymnocephalus cernuus*, and black carp, *Mylopharyngodon piceus* .

Issue:

▶ Water use laws need to be updated.

Strategies:

- Encourage appreciation for public streams and rivers; educate landowners of the importance of streams and rivers to wildlife.
- Change the water laws to allow conservation without losing water rights.
- Investigate water banking and tax credits.
- Provide incentives to promote recharge to aquifers.

Issue:

▶ There is a lack of data on species present, and habitat needs.

Strategies:

- Conduct wildlife surveys.
- Conduct studies of habitat needs of species that inhabit the area.
- Conduct studies on habitat quality and quantity.

Issue:

▶ Fisheries management as it relates to stocking game fish can be detrimental to native species.

Strategies:

- Develop a "clean" list of species allowed in Kansas to complement the Lacy Act.

Monitoring for the Riparian Corridor Complex:

♦ Monitor the number of landowners who sign-up in various programs.
♦ Identify the number of better management practices developed and implemented and monitor periodically.
♦ Identify the number of acres in conservation easement and monitor periodically.
♦ Monitor changes in number of landowners using best management practices.
♦ Monitor number of acres acquired for wildlife habitat.
♦ Implement attitude/knowledge surveys of landowners and managers about best management practices and wildlife and repeat periodically.
♦ Develop baseline information on species, habitats and interactions as a starting point; reassess every 5-10 years.
♦ Use GIS as a tool to measure land use changes
♦ Use data developed from cooperative ventures.
♦ Implement attitude/knowledge surveys of general public and K-12 students and repeat periodically.
♦ Implement water quality and quantity monitoring programs.

- ♦ Monitor the number of greenway or wildlife corridors
- ♦ Identify the number of acres conserved (fenced, buffers, etc.) and monitor periodically.
- ♦ Identify and monitor change over time of the number of water rights retired or purchased.
- ♦ Identify and monitor change over time of the number of river bank protection projects.

Potential Partners for the Shortgrass Prairie Conservation Region

- Audubon of Kansas
- Central Plains Society of Mammalogists
- County commissioners
- County Extension Service
- County road depts.
- County weed depts.
- Ducks Unlimited
- Fort Hays State University
- Kansas Association for Conservation and Environmental Education
- Kansas Biological Survey
- Kansas Dept. of Agriculture
- Kansas Dept. of Wildlife and Parks
- Kansas Farm Bureau
- Kansas Herpetology Society
- Kansas State University
- Kansas Ornithological Society
- Kansas Grazing Coalition
- Natural Resources Conservation Service
- Playa Lakes Joint Venture
- Private landowners
- Rocky Mountain Bird Observatory
- Society of Range Management
- Sternberg Museum
- The Nature Conservancy
- The Wildlife Society
- US Dept of Agriculture
- US Environmental Protection Agency
- US Farm Services Agency
- US Fish and Wildlife Service
- US Geological Service

Central Mixed Grass Prairie Conservation Region

The Central Mixed Grass Prairie Conservation Region is located in the central part of Kansas and is the transition area between the Shortgrass Prairie Conservation Region to the west and the Eastern Tallgrass Prairie Conservation Region to the east. It includes all or part of the Smoky Hills, the Arkansas River Lowlands, the Wellington-McPherson Lowlands, the High Plains, and the Red Hills physiographic regions. It is characterized by rolling plains with outcrops, breaks, and river valleys. It is drained by several river systems including the Arkansas, Solomon, and Saline. Annual rainfall is between 20-30 inches. Crops, grazing and climate are the primary factors influencing this conservation region. The upland areas have a mixture of Shortgrass Prairie and Tallgrass Prairie species. In the river valleys and riparian areas, deciduous woodlands, shrubland and herbaceous wetlands are common.

Attempts were made to incorporate elements of more specific plans available through the Playa Lakes Joint Venture (PLJV). This organization is a mixture of public agencies and private organizations devoted to wildlife conservation in a region covering all of the mixed grass prairie in Kansas along with substantial portions in other states and physiographic regions. Priority species identified by the PLJV assisted in identifying Species of Greatest Conservation Need in this plan. The final specific habitat goals available through the PLJV were not available at the time of the Kansas CWCP Summit and subsequent review timetable for drafts. Regardless, the PLJV Area Implementation Plan for BCR 19 prepared through the PLJV represents a logical operational level plan as a related extension of this effort. The kinds of specifics expected in operational planning and implementation are inherent in the PLJV plans and we encourage their reference and use as a natural extension of the utility of this document.

The habitats for the Mixed Grass Prairie Conservation Region are listed in general priority order. The key habitats are identified with an asterisk (*).

Mixed Prairie*
Sand Prairie*
Herbaceous Wetland*
Aquatic- Western Lotic (flowing waters)*
Seeps and Springs*
Aquatic – Eastern Large Rivers*
Sandsage Shrubland
CRP/Native
Bur Oak
Deciduous Floodplain
Cropland
Evergreen (cedar)
Riparian Shrubland
Urban Areas
Caves
Aquatic-Western Lentic (still waters)
Cool Season Conservation Plantings

Mixed Prairie Habitat and the Sand Prairie Habitat

The Mixed Prairie Habitat is a combination of the Kansas GAP Western Wheatgrass Prairie, Mixed Prairie and the Mixed Prairie – Disturbed. The quality and quantity trends for these habitats are both declining. They are located primarily in the Smoky Hill and the High Plains regions of Kansas. Some of the predominant plant species are

Pascopyrum (*Agropyron*) *smithi* - Western Wheatgrass
Schizachyrium scoparium – Little Bluestem
Bouteloua curtipendula - Sideoats Grama
Sporobolus asper - Tall Dropseed

The Sand Prairie Habitat is found in well-drained sand soils in the Arkansas River Lowlands, the Red Hills, the Smoky Hills, and the Wellington-McPherson Lowlands. The Sand Prairie Habitat quality and quantity trends are both declining. Sand Bluestem, *Andropogon hallii,* is the primary plant species. Other species include:

Calamovilfa longifolia - Prairie Sand Reed
Helianthus petiolaris - Prairie Sunflower
Monarda punctata - Beebalm
Oenothera rhombipetala - Fourpoint Evening Primrose
Panicum virgatum - Switchgrass
Prunus angustifolia - Sand Hill Plum
Schizachyrium scoparium – Little Bluestem

The Species of Greatest Conservation Need for the Mixed Prairie Habitat are listed on Table 4. They are ranked into tiers. This process is shown in detail in Appendix 1 "Kansas' Species of Greatest Conservation Need – Selection and Ranking". This ranking established a baseline against which future evaluations and monitoring can be compared, on a species basis. It will also be used to prioritize research and survey proposals.

Table 4. Central Mixed Grass Conservation Region
Mixed Prairie Habitat
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Birds	Henslow's Sparrow	*Ammodramus henslowii*	15	I
Birds	Ferruginous Hawk	*Buteo regalis*	14	I
Mammals	Black-tailed Prairie Dog	*Cynomys ludovicianus*	14	I
Birds	Lesser Prairie-Chicken	*Tympanuchus pallidicinctus*	14	I
Birds	Loggerhead Shrike	*Lanius ludovicianus*	13	I
Birds	Baird's Sparrow	*Ammodramus bairdii*	13	I
Birds	Long-billed Curlew	*Numenius americanus*	13	I
Birds	Greater Prairie-Chicken	*Tympanuchus cupido*	12	I
Mammals	Spotted Skunk (T)	*Spilogale putorius*	12	I
Mammals	Black-footed Ferret (E) (X)	*Mustela nigripes*	12	I
Birds	Burrowing Owl	*Athene cunicularia*	12	I
Birds	Sprague's Pipit	*Anthus spragueii*	12	I
Birds	Golden Eagle	*Aquila chrysaetos*	12	I
Reptiles	Lesser Earless Lizard	*Holbrookia maculata*	11	I

Table 4. Central Mixed Grass Conservation Region
Mixed Prairie Habitat
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Birds	Chestnut-collared Longspur	*Calcarius ornatus*	11	I
Birds	Smith's Longspur	*Calcarius pictus*	11	I
Birds	Short-eared Owl	*Asio flammeus*	11	I
Birds	Common Poorwill	*Phalaenoptilus nuttallii*	11	I
Birds	Buff-breasted Sandpiper	*Tryngites subruficollis*	11	I
Birds	American Golden-Plover	*Pluvialis dominica*	11	I
Birds	Bell's Vireo	*Vireo bellii*	11	I
Birds	Swainson's Hawk	*Buteo swainsoni*	11	I
Mammals	Southern Bog Lemming	*Synaptomys cooperi*	11	I
Reptiles	Checkered Garter Snake (T)	*Thamnophis marcianus*	11	I
Mammals	Franklin's Ground Squirrel	*Spermophilus franklinii*	11	I
Mammals	Swift Fox	*Vulpes velox*	10	II
Birds	Common Nighthawk	*Chordeiles minor*	10	II
Insect	Arogos Skipper	*Atrytone arogos*	10	II
Birds	Scissor-tailed Flycatcher	*Tyrannus forficatus*	10	II
Birds	Upland Sandpiper	*Bartramia longicauda*	10	II
Birds	Lark Sparrow	*Chondestes grammacus*	10	II
Amphibians	Red-spotted Toad	*Bufo punctatus*	10	II
Reptiles	Massasauga	*Sistrurus catenatus*	10	II
Birds	Brown Thrasher	*Toxostoma rufum*	10	II
Amphibians	Strecker's Chorus Frog (T)	*Pseudacris streckeri*	10	II
Birds	Grasshopper Sparrow	*Ammodramus savannarum*	10	II
Birds	Lark Bunting	*Calamospiza melanocorys*	10	II
Reptiles	Texas Horned Lizard	*Phrynosoma cornutum*	10	II
Reptiles	Western Hognose Snake	*Heterodon nasicus*	10	II
Reptiles	Eastern Hognose Snake	*Heterodon platirhinos*	10	II
Birds	Dickcissel	*Spiza americana*	10	II
Birds	Eastern Meadowlark	*Sturnella magna*	10	II
Reptiles	Night Snake	*Hypsiglena torquata*	9	III
Reptiles	Eastern Glossy Snake	*Arizona elegans*	9	III
Reptiles	Ground Snake	*Sonora semiannulata*	9	III
Reptiles	Longnose Snake (T)	*Rhinocheilus lecontei*	9	III
Birds	Northern Bobwhite	*Colinus virginianus*	9	III
Insect	Monarch	*Danaus plexippus*	9	III
Birds	Field Sparrow	*Spizella pusilla*	9	III
Birds	American Tree Sparrow	*Spizella arborea*	9	III
Birds	Eastern Kingbird	*Tyrannus tyrannus*	9	III
Birds	Western Kingbird	*Tyrannus verticalis*	9	III
Reptiles	Texas Blind Snake (T)	*Leptotyphlops dulcis*	9	III
Reptiles	Milk Snake	*Lampropeltis triangulum*	8	III
Reptiles	Prairie Rattlesnake	*Crotalus viridis*	8	III

(T) means State Threatened (Federal threatened are included)
(E) means State Endangered (Federal endangered are included)
(X) means extirpated

The Species of Greatest Conservation Need for the Sand Prairie Habitat are listed on Table 5. They are ranked into tiers. This process is shown in detail in Appendix 1 "Kansas' Species of Greatest Conservation Need – Selection and Ranking". This ranking established a baseline against which future evaluations and monitoring can be compared, on a species basis. It will also be used to prioritize research and survey proposals.

Table 5. Central Mixed Grass Conservation Region
Sand Prairie Habitat
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Birds	Ferruginous Hawk	*Buteo regalis*	14	I
Mammals	Black-tailed Prairie Dog	*Cynomys ludovicianus*	14	I
Birds	Lesser Prairie-Chicken	*Tympanuchus pallidicinctus*	14	I
Birds	Loggerhead Shrike	*Lanius ludovicianus*	13	I
Birds	Burrowing Owl	*Athene cunicularia*	12	I
Mammals	Black-footed Ferret (E) (X)	*Mustela nigripes*	12	I
Mammals	Spotted Skunk (T)	*Spilogale putorius*	12	I
Birds	Golden Eagle	*Aquila chrysaetos*	12	I
Birds	Greater Prairie-Chicken	*Tympanuchus cupido*	12	I
Birds	Bell's Vireo	*Vireo bellii*	11	I
Birds	Short-eared Owl	*Asio flammeus*	11	I
Birds	American Golden-Plover	*Pluvialis dominica*	11	I
Birds	Common Poorwill	*Phalaenoptilus nuttallii*	11	I
Reptiles	Lesser Earless Lizard	*Holbrookia maculata*	11	I
Birds	Swainson's Hawk	*Buteo swainsoni*	11	I
Mammals	Swift Fox	*Vulpes velox*	10	II
Insect	Arogos Skipper	*Atrytone arogos*	10	II
Birds	Common Nighthawk	*Chordeiles minor*	10	II
Insect	Mottled Duskywing	*Erynnis martialis*	10	II
Birds	Dickcissel	*Spiza americana*	10	II
Reptiles	Massasauga	*Sistrurus catenatus*	10	II
Reptiles	Eastern Hognose Snake	*Heterodon platirhinos*	10	II
Reptiles	Western Hognose Snake	*Heterodon nasicus*	10	II
Reptiles	Texas Horned Lizard	*Phrynosoma cornutum*	10	II
Birds	Scissor-tailed Flycatcher	*Tyrannus forficatus*	10	II
Birds	Lark Sparrow	*Chondestes grammacus*	10	II
Birds	Lark Bunting	*Calamospiza melanocorys*	10	II
Birds	Grasshopper Sparrow	*Ammodramus savannarum*	10	II
Birds	Brown Thrasher	*Toxostoma rufum*	10	II
Amphibians	Strecker's Chorus Frog (T)	*Pseudacris streckeri*	10	II
Birds	Northern Bobwhite	*Colinus virginianus*	9	III
Birds	Western Kingbird	*Tyrannus verticalis*	9	III
Reptiles	Eastern Glossy Snake	*Arizona elegans*	9	III
Reptiles	Longnose Snake (T)	*Rhinocheilus lecontei*	9	III
Insect	Monarch	*Danaus plexippus*	9	III
Birds	American Tree Sparrow	*Spizella arborea*	9	III
Reptiles	Milk Snake	*Lampropeltis triangulum*	8	III

Table 5. Central Mixed Grass Conservation Region Sand Prairie Habitat Species of Greatest Conservation Need				
Group	**Common Name**	**Scientific Name**	**Total**	**Tier**
Reptiles	Prairie Rattlesnake	*Crotalus viridis*	8	III

(T) means State Threatened (Federal threatened are included)
(E) means State Endangered (Federal endangered are included)
(X) means extirpated

Issues and Strategies: for the Mixed Prairie and Sand Prairie Habitats

The issues, with their accompanying strategies, are listed in general priority order.

Issues:

Land Use:

- The conversion and fragmentation of land to agriculture is having a negative impact on the flora and fauna of the Mixed Prairie and Sand Prairie Habitats.
- The expansion of urban areas is having a negative impact on the flora and fauna of the Mixed Prairie and Sand Prairie Habitats.
- The expansion of industrial wind energy facilities is having a negative impact on the flora and fauna of the Mixed Prairie and Sand Prairie Habitats.
- Invasive woody and herbaceous species are having a negative impact on the flora and fauna of the Mixed Prairie and Sand Prairie Habitats.
- The suppression of fires is having a negative impact on the flora and fauna of the Mixed Prairie and Sand Prairie Habitats.

Strategies:

- Inform and promote, with landowners and managers, the benefits and proper use of fire to manage habitat.
- Inform landowners and the public about the need and the techniques to control woody invasive species.
- Inform and promote proper grazing practices with landowners and managers.
- Research and investigate better management practices to control woody invasive species.
- Research the effects of coal beds/methane extraction on wildlife and water quality.
- Conduct pre and post studies on energy facility sites to determine the impact on wildlife and habitat.
- Investigate the effects of pesticides (collateral damage/unintended consequences) and provide that information to the public.
- Research temperature and vegetation impacts caused by wind generators.
- Assess habitat fragmentation and its implications to natural communities through GAP analysis.
- Work with county zoning boards to implement good urban planning procedures.
- Offer incentives to landowners not to sell land for private development.
- Develop greenways and wildlife corridors.
- Promote appropriate use of fire to control woody invasive species.
- Promote mechanical control for woody invasive species.

- Provide financial incentives to control woody invasive species and noxious weeds.
- Implement procedures to discourage planting of invasive species and to encourage planting appropriate species.
- Develop plots to demonstrate best management practices on public and private lands.
- Offer incentives to private landowners not to convert their lands to agriculture.
- Expand the Grassland Reserve Program.
- Develop programs to acquire more conservation easements where advisable and possible.
- Expand the Sod Buster program.
- Apply best management practices that provide benefits to landowners and to wildlife.
- Encourage ranchers to consider long term over short term benefits.
- Work with other state agencies, such as the Kansas Department of Transportation, to avoid, minimize, reduce and mitigate impacts to habitat resulting from their programs.
- Increase access/linking on Internet in rural areas and make information available on Internet, KDWP/NCRS/etc sites.
- Increase personnel in the field to expand the contacts between natural resource professionals and landowners.
- Promote and encourage formation of coalitions/associations such as the Comanche Pool Prairie Resource Foundation.
- Develop grass banking for conservation purposes.
- Acquire lands for conservation purposes through willing sellers.
- Develop and implement a Kansas invasive species plan.
- Develop a siting policy for wind energy facilities.
- Move the review of wind energy siting to state management.
- Develop regulations for coal bed/methane extraction at state level (KCC).
- Implement Wildlife expert review of wind energy siting effects on prairie chickens, bats, etc, and make recommendations.
- Enlist private landowner cooperation to accomplish effective progress in wildlife conservation.
- Continue to broaden support for federal farm programs (CRP, Swampbuster, etc.).
- Cooperate with the National Audubon Society relative to the IBA (Important Birding Areas) program.
- Work with the Kansas Department of Agriculture on biological controls of pest insects rather than chemical treatment to reduce impacts to non-target invertebrates.
- Cooperate with the state and federal Department of Agriculture in developing management strategies for coping with potential problems from exotic livestock and wildlife introductions.
- Coordinate strategies with Native American Tribes.
- Recreate and implement tax credit and conservation easement programs.
- Provide economic incentives to landowners for habitat conservation (both terrestrial and aquatic) efforts.

Issues:

Lack of Data:

- There is a lack of data concerning wildlife distribution, population trends and habitat associations of the Mixed Prairie and Sand Prairie Habitats.
- There is a lack of understanding regarding the components of quality habitat and the quantity of those components needed in the Mixed Prairie and Sand Prairie Habitats.
- Research is needed to understand the impact of fragmentation on the Mixed Prairie and Sand Prairie Habitats.
- There is a need to better understand the effects that a specific wildlife plan for one species has on other species.

Strategies:

- Develop effective information and educational materials for the black-tailed prairie dog, *Cynomys ludovicianus*.
- Implement a structured census for reptiles to provide good baseline data and eventual trend information on populations and ranges.
- Evaluate impacts of exotic introductions, diseases, and parasites, and ways to mitigate their impacts.
- Develop contingency plans for managing exotic wildlife.
- Develop species-specific studies on effects of rangeland management techniques.
- Initiate 5 or 10-year interval distributional surveys of greater and lesser prairie chickens, and other declining bird species.
- Research effects of habitat fragmentation.
- Determine the status, distribution, and requirements of endangered species, threatened species, and species in need of conservation (emphasizing studies on blue sucker and sicklefin chub).
- Determine population status, critical habitats, and limiting factors of riverine biota of southeast Kansas with emphasis on the lower Arkansas River basin.
- Place special emphasis on programs to study and conserve grassland-nesting birds.
- Improve baseline information on species, habitats and their interactions.
- For mammals, describe habitat associations and measure trends in habitat distribution and quality in coordination with the Central Plains Society of Mammalogists.
- Assess the range and distribution of particular restricted range species, such as the Southern bog lemming, *Synaptomys cooperi*
- Identify indicator species for the Mixed Prairie and Sand Prairie Habitats.
- Improve information base on distribution of wildlife.
- Improve information base on population trends.
- Improve information base on quality habitat.
- Expand Konza Prairie studies statewide.
- Use GIS to assist local governments with planning.
- Produce GIS mapping, with layers for wetlands, riparian areas, sensitive areas, public ownership, breeding bird data, fish and wildlife distribution and abundance, species ranges and aquatic habitat parameters, and incorporate with GAP.
- Develop a state biodiversity plan to include inventory and monitoring, and community restoration strategies.
- Implement a non-indigenous species management plan for Kansas.

- Cooperate with Partners in Flight and national water bird and shore bird initiatives.
- Become involved directly with the North American Bird Conservation Initiative.
- Maintain close coordination with the Kansas Herpetological Society.
- Initiate active participation in the National Amphibian Conservation Program.
- Continue participating in the National Amphibian Abnormality Monitoring Program.
- Coordinate projects and programs with the Kansas Chapter of American Fisheries Society.
- Develop projects to reintroduce previously extirpated species, such as the Black-capped Vireo.

Issues:

Lack of Knowledge and Understanding

- ▶ There is a lack of knowledge and understand about the Mixed Prairie and Sand Prairie Habitats among the general public, landowners, and local officials.
- ▶ School (K-12 curriculum development) standards do not include wildlife conservation topics.

Strategies:

- Work for wildlife conservation education to be taught in K-12.
- Develop and require wildlife conservation education for educators.
- Explore greater opportunities to cooperate with non-school entities that promote environmental education.
- Expand the OWLS (Outdoor Wildlife Learning Sites) program.
- Coordinate volunteer and governmental education efforts.
- Develop and implement programs specifically targeted at various segments of the public so that they better understand management practices.
- Provide cost-share grants to communities and organizations for stimulating nature-based tourism consistent with conservation objectives.
- Enhance the development of wildlife teaching materials and programs from K-College for administrators, teacher trainers, and teachers that help link environmental literacy components to existing curriculum standards. This would include teacher workshops on wildlife diversity, with credit for re-certification.
- Supply resources to help expand conservation education workshops for teachers and youth leaders, including efforts with Project Wild, Project Aquatic, Project Wet, and Project Learning Tree. Consider weeklong workshops for teacher credit.
- Develop additional videos for education and appreciation of wildlife; making wildlife and environmental education video programs available to public television and cable/community channels throughout Kansas.
- Continue presentations and exhibits at the state fair, boat shows, garden shows, etc.
- Develop an effective wildlife viewing and appreciation program consisting of the "Watching Kansas Wildlife" viewing guide, a signing program for areas included in the guide, and the promotion of special events, festivals, nature tourism, and citizen science programs.
- Support efforts of the Kansas Nature-based Tourism Alliance and the NaturalKansas.org website.

- Develop more nature, wildlife, and endangered species brochures, trading cards, posters and other materials, stressing educational programs and information on the importance of wildlife habitat, enhancing the awareness and appreciation of little-known or misunderstood wildlife species.
- Develop interpretive guides and informational material to increase awareness and appreciation of all species.

Issues:

Water Quality and Quantity

- ▶ Runoff of pesticides and fertilizers has negative impacts on the flora and fauna of the Mixed Prairie and Sand Prairie Habitats.
- ▶ Irrigation usage continues to be a problem for wildlife.

Strategies:

- Monitor impacts to fisheries from pollution sources.
- Identify pollution problem areas and improve conditions detrimental to biodiversity and endangered species.
- Promote improved water quality standards and minimum desirable stream flows.
- Investigate contaminant effects on reptilian and amphibian populations.
- Promote sound water quality standards and their enforcement through education and continued coordination with the Kansas Department of Health and Environment, and relate the standards to stream ratings, dependent on the presence of rare fishes, unique assemblages, or high biodiversity.
- Acquire rare, critical and/or important habitats, especially wetlands, through willing sellers.
- Enhance wetlands and develop riparian buffers in order to improve fish habitats.

Monitoring of the Mixed Prairie and Sand Prairie Habitats:

- ♦ Identify the number of greenways and wildlife corridors and monitor periodically.
- ♦ Measure the change in acres of invasive species.
- ♦ Identify the number of acres in conservation easement and monitor periodically.
- ♦ Monitor changes in number of landowners using best management practices.
- ♦ Monitor number of acres acquired for wildlife habitat.
- ♦ Implement attitude/knowledge surveys of landowners and managers about best management practices and wildlife and repeat periodically.
- ♦ Develop baseline information on species, habitats and interactions as a starting point; reassess every 5-10 years.
- ♦ Use GIS as a tool to measure land use changes.
- ♦ Use data developed from joint ventures.
- ♦ Implement attitude/knowledge surveys of general public and K-12 students and repeat periodically.
- ♦ Implement water quality and quantity monitoring programs.

Herbaceous Wetland Habitat

The Herbaceous Wetland habitat in the Central Mixed Grass Prairie Conservation Region is comprised of the KS-GAP Wetland Alliance's habitats of Salt Marsh/Prairie, Spikerush Playa Lake, Playa Lake, Low or Wet Prairie, Freshwater Marsh, Cattail Marsh, and Weedy Marsh. The quality and quantity trends for this habitat are both declining. This includes temporary, seasonal and permanent wetlands.

The Species of Greatest Conservation Need for the Herbaceous Wetland Habitat are listed on Table 6. They are ranked into tiers. This process is shown in detail in Appendix 1 "Kansas' Species of Greatest Conservation Need – Selection and Ranking". This ranking established a baseline against which future evaluations and monitoring can be compared, on a species basis. It will also be used to prioritize research and survey proposals.

Table 6. Central Mixed Grass Conservation Region
Herbaceous Wetland Habitat
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Birds	Snowy Plover (T)	*Charadrius alexandrinus*	14	I
Birds	Long-billed Curlew	*Numenius americanus*	13	I
Birds	Eskimo Curlew (E)	*Numenius borealis*	13	I
Birds	Black Rail	*Laterallus jamaicensis*	13	I
Birds	Hudsonian Godwit	*Limosa haemastica*	13	I
Birds	Rusty Blackbird	*Euphagus carolinus*	13	I
Birds	Baird's Sparrow	*Ammodramus bairdii*	13	I
Amphibians	Crawfish Frog	*Rana areolata*	12	I
Birds	Black-bellied Plover	*Pluvialis squatarola*	12	I
Birds	Least Tern (E)	*Sterna antillarum*	12	I
Birds	Piping Plover (T)	*Charadrius melodius*	12	I
Birds	Stilt Sandpiper	*Calidris himantopus*	12	I
Birds	Bobolink	*Dolichonyx orzivorus*	12	I
Birds	Whooping Crane (E)	*Grus americana*	12	I
Birds	Peregrine Falcon (E)	*Falco peregrinus*	12	I
Birds	Black-billed Cuckoo	*Coccyzus erythropthalmus*	12	I
Birds	American Golden-Plover	*Pluvialis dominica*	11	I
Birds	Swainson's Hawk	*Buteo swainsoni*	11	I
Mammals	Southern Bog Lemming	*Synaptomys cooperi*	11	I
Birds	Pectoral Sandpiper	*Calidris melanotos*	11	I
Birds	Black-crowned Night-Heron	*Nycticorax nycticorax*	11	I
Birds	Long-billed Dowitcher	*Limnodromus scolopaceus*	11	I
Birds	Least Bittern	*Ixobrychus exilis*	11	I
Birds	Little Blue Heron	*Egretta caerulea*	11	I
Reptiles	Checkered Garter Snake (T)	*Thamnophis marcianus*	11	I
Birds	Buff-breasted Sandpiper	*Tryngites subruficollis*	11	I
Birds	Black Tern	*Chlidonias niger*	11	I
Birds	Forster's Tern	*Sterna forsteri*	11	I

Table 6. Central Mixed Grass Conservation Region
Herbaceous Wetland Habitat
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Birds	Short-eared Owl	*Asio flammeus*	11	I
Birds	Brewer's Blackbird	*Euphagus cyanocephalus*	11	I
Birds	Great Egret	*Ardea alba*	10	II
Birds	American Bittern	*Botaurus lentiginosus*	10	II
Amphibians	Strecker's Chorus Frog (T)	*Pseudacris streckeri*	10	II
Amphibians	Northern Cricket Frog	*Acris crepitans*	10	II
Amphibians	Red-spotted Toad	*Bufo punctatus*	10	II
Birds	Northern Pintail	*Anas acuta*	10	II
Reptiles	Massasauga	*Sistrurus catenatus*	10	II
Birds	Bald Eagle (T)	*Haliaeetus leucocephalus*	10	II
Birds	Least Sandpiper	*Calidris minutilla*	10	II
Birds	Greater Yellowlegs	*Tringa melanoleuca*	10	II
Birds	American Avocet	*Recurvirostra americana*	10	II
Birds	Upland Sandpiper	*Bartramia longicauda*	10	II
Birds	Baird's Sandpiper	*Calidris bairdii*	10	II
Birds	Eastern Meadowlark	*Sturnella magna*	10	II
Birds	Lesser Yellowlegs	*Tringa flavipes*	10	II
Birds	Western Grebe	*Aechmophorus occidentalis*	9	III
Birds	Eared Grebe	*Podiceps nigricollis*	9	III
Birds	American White Pelican	*Pelecanus erythrorhynchos*	9	III
Birds	Semipalmated Sandpiper	*Calidris pusilla*	9	III
Birds	Mississippi Kite	*Ictinia mississippiensis*	9	III
Birds	White-rumped Sandpiper	*Calidris fuscicollis*	9	III
Birds	Canvasback	*Aythya valisineria*	9	III
Birds	Wilson's Phalarope	*Phalaropus tricolor*	9	III
Birds	Snowy Egret	*Egretta thula*	9	III

(T) means State Threatened (Federal threatened are included)
(E) means State Endangered (Federal endangered are included)
(X) means extirpated

Issues and Strategies: for the Herbaceous Wetland Habitat

The issues, with their accompanying strategies, are listed in general priority order.

Issue:

- Herbaceous Wetlands are being converted to agricultural uses; some are being drained and plowed, others are used in irrigation operations as water sources and as irrigation return pits.

Strategies:

- Develop and implement public information and education programs.
- Research and investigate best management practices.
- Encourage conservation easements and wetland reserve programs.
- Discourage the planting of invasive species.
- Encourage planting appropriate species.

- Work with the county zoning boards to implement good urban planning procedures.
- Offer incentives to landowner not to sell land for private development.
- Develop greenways and wildlife corridors.
- Develop plots to demonstrate best management practices on public and private lands.
- Offer incentives to private landowners not to convert their lands to agriculture.

Issue:

▶ Pollution from point and non-point sources is having a negative impact on the flora and fauna of the Herbaceous Wetland Habitat.

Strategies:

- Investigate effects of pesticides/herbicides (unintended consequences) and develop management options.
- Promote ecologically sound techniques for flood control, erosion control, non-point source pollution control, and bank stabilization, which will provide high aquatic habitat diversity, and determine engineering techniques for preventing monotypic habitats.
- Encourage fencing where necessary to set back succession, and otherwise conduct proper grazing management.
- Plant vegetation strips or buffers around wetlands to reduce siltation and filter pollutants.
- Enhance wetlands and develop riparian buffers to improve fish habitats.

Issue:

▶ Invasive plants, especially woody species, are having a negative impact on the Herbaceous Wetland Habitat.

Strategies:

- Inform landowners and the public about the need for and the techniques required to control woody invasive species.
- Research and investigate better management practices to control woody invasive species.
- Promote appropriate use of fire to control woody invasive species.
- Promote mechanical control for woody invasive species.
- Provide financial incentives to control woody invasive species.
- Control woody invasive species, exotics, cattail and bulrush with prescribed burning and by mechanical means.
- Implement procedures to discourage planting of invasive species and to encourage planting appropriate species.
- Develop plots to demonstrate best management practices on public and private lands
- Complete and apply a state invasive species plan.

Issues:

Water Problems:

▶ The decline of the water table is having negative impacts on the Herbaceous Wetland Habitat.

- ▶ The use of water from Herbaceous Wetlands for irrigation is having a negative impact.

Strategies:

- Increase access/linking on Internet in rural areas and make information available on Internet, KDWP/NCRS/etc sites.
- Promote and encourage formation of coalitions/associations such as the Comanche Pool Prairie Resource Foundation.
- Acquire rare, critical and/or important wetland habitats on a willing seller basis.
- Acquire water rights for wetlands as advisable and possible.
- Research and develop engineering techniques for efficient wetland management.
- Maximize habitat diversity on wetlands for wildlife species.
- Work with neighboring states to gain compliance of interstate compacts.
- Develop appropriate water use allocations and enforce them.
- Offer incentives to private landowners not to convert their lands to agriculture.
- Expand the Wetlands Reserve Program.
- Develop programs to acquire more conservation easements as advisable and possible.
- Expand the Sod Buster program.
- Develop practices that provide benefits to landowners and to wildlife.
- Encourage ranchers to consider long term over short term benefits
- Increase personnel in the field to expand the contacts between natural resource professionals and landowners.

Issue:

- ▶ The definition of wetlands is different for local governments, the state, and the federal government.

Strategies:

- Continue efforts for one state, local, federal definition of wetlands.
- Form a coalition for support of national efforts to get an agreed-upon definition.

Issue:

- ▶ There is a lack of data on species present, and habitat needs.

Strategies:

- Conduct wildlife surveys.
- Conduct studies of habitat needs of species that inhabit the area.
- Conduct studies on habitat quality and quantity.

Issue:

- ▶ Funding for programs to manage Herbaceous Wetland is limited.

Strategies:

- Educate the public about the value of wetlands so they will support increased funding.
- Support eco-tourism efforts such as the Kansas Nature-based Tourism Alliance to promote values of wetlands.
- Seek out ways to leverage existing funds and search out new funding sources.

Monitoring for the Herbaceous Wetlands Habitat

- Monitor the number of landowners who sign-up in various programs.
- Identify the number of better management practices developed and implemented and monitor periodically.
- Measure the change in acres of invasive species.
- Identify the number of acres in conservation easement and monitor periodically.
- Monitor changes in number of landowners using best management practices.
- Monitor number of acres acquired for wildlife habitat.
- Implement attitude/knowledge surveys of landowners and managers about best management practices and wildlife and repeat periodically.
- Develop baseline information on species, habitats and interactions as a starting point; reassess every 5-10 years.
- Use GIS as a tool to measure land use changes
- Use data developed from cooperative ventures.
- Implement attitude/knowledge surveys of general public and K-12 students and repeat periodically.
- Implement water quality and quantity monitoring programs.
- Monitor the number of greenway or wildlife corridors
- Identify the number of wetlands conserved (fenced, buffers, etc.) and monitor periodically.
- Implementation of state invasive species plan.
- Identify and monitor change over time of the number of water rights retired or purchased.

Aquatic – Western Lotic (flowing water) Habitat

The Aquatic – Western Lotic (flowing water) Habitat includes rivers, streams, and their tributaries in the Arkansas, Smoky Hill, Saline and Solomon River Basins of the Central Mixed Grass Conservation Region. The quality and quantity trends for this habitat are both declining.

The Species of Greatest Conservation Need for the Aquatic – Western Lotic (flowing water) Habitat are listed on Table 7. They are ranked into tiers. This process is shown in detail in Appendix 1 "Kansas' Species of Greatest Conservation Need – Selection and Ranking". This ranking established a baseline against which future evaluations and monitoring can be compared, on a species basis. It will also be used to prioritize research and survey proposals.

Table 7. Central Mixed Grass Conservation Region
Aquatic – Western Lotic (flowing water) Habitat
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Fish	Arkansas Darter (T)	*Etheostoma cragini*	14	I
Birds	Snowy Plover (T)	*Charadrius alexandrinus*	14	I
Fish	Topeka Shiner (T)	*Notropis topeka*	14	I
Fish	Northern Plains Killifish	*Fundulus kansae*	13	I
Fish	Plains Minnow	*Hybognathus placitus*	13	I
Fish	Arkansas River Shiner (X) (E)	*Notropis girardi*	13	I

Table 7. Central Mixed Grass Conservation Region
Aquatic – Western Lotic (flowing water) Habitat
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Birds	Least Tern (E)	*Sterna antillarum*	12	I
Birds	Stilt Sandpiper	*Calidris himantopus*	12	I
Fish	Flathead Chub (T)	*Platygobio gracilis*	12	I
Fish	Southern Redbelly Dace	*Phoxinus erythrogaster*	12	I
Fish	Brassy Minnow	*Hybognathus hankinsoni*	12	I
Mussels	Cylindrical Papershell	*Anodontoides ferussacianus*	12	I
Reptiles	Checkered Garter Snake (T)	*Thamnophis marcianus*	11	I
Fish	River Shiner	*Notropis blennius*	11	I
Fish	Common Shiner	*Luxilus cornutus*	11	I
Birds	Black-crowned Night-Heron	*Nycticorax nycticorax*	11	I
Mussels	Pondhorn	*Uniomerus tetralasmus*	11	I
Birds	Long-billed Dowitcher	*Limnodromus scolopaceus*	11	I
Mammals	Pallid Bat	*Antrozous pallidus*	11	I
Birds	Pectoral Sandpiper	*Calidris melanotos*	11	I
Birds	Little Blue Heron	*Egretta caerulea*	11	I
Fish	Shoal Chub	*Macrhybopsis hyostoma*	11	I
Birds	Forster's Tern	*Sterna forsteri*	11	I
Fish	Johnny Darter	*Etheostoma nigrum*	10	II
Birds	Great Egret	*Ardea alba*	10	II
Birds	Greater Yellowlegs	*Tringa melanoleuca*	10	II
Amphibians	Northern Cricket Frog	*Acris crepitans*	10	II
Reptiles	Massasauga	*Sistrurus catenatus*	10	II
Birds	Northern Pintail	*Anas acuta*	10	II
Birds	Lesser Yellowlegs	*Tringa flavipes*	10	II
Birds	Bald Eagle (T)	*Haliaeetus leucocephalus*	10	II
Birds	Least Sandpiper	*Calidris minutilla*	10	II
Birds	Baird's Sandpiper	*Calidris bairdii*	10	II
Mussels	Pimpleback	*Quadrula pustulosa*	9	III
Mussels	Pondmussel	*Ligumia subrostrata*	9	III
Turtles	Smooth Softshell	*Apalone mutica*	9	III
Birds	White-rumped Sandpiper	*Calidris fuscicollis*	9	III
Crustaceans	A Crayfish	*Orconectes neglectus*	9	III
Birds	Wilson's Phalarope	*Phalaropus tricolor*	9	III
Birds	Semipalmated Sandpiper	*Calidris pusilla*	9	III
Birds	Snowy Egret	*Egretta thula*	9	III
Fish	Orangethroat Darter	*Etheostoma spectabile*	8	III
Fish	Stonecat	*Noturus flavus*	8	III
Mussels	Giant Floater	*Pyganodon grandis*	8	III
Mussels	Mapleleaf	*Quadrula quadrula*	8	III
Mussels	Fragile Papershell	*Leptodea fragilis*	7	III
Mussels	Pink Papershell	*Potamilus ohiensis*	7	III

(T) means State Threatened (Federal threatened are included)
(E) means State Endangered (Federal endangered are included)
(X) means extirpated

Issues and Strategies: for the Aquatic - Western Lotic (flowing water) Habitat

The issues, with their accompanying strategies, are listed in general priority order.

Issues:

Water Problems

- The decline of the water table is having negative impacts on the rivers and streams.
- The use of water from rivers and streams for irrigation is lowering the water level and is having negative impacts on flora and fauna.

Strategies:

- Research and develop engineering techniques for effective river and stream management.
- Acquire rare, critical and/or important habitats through willing sellers.
- Acquire water rights as advisable and possible.
- Maximize habitat diversity on rivers and streams for wildlife species.
- Work with neighboring states to gain compliance of interstate compacts.
- Develop appropriate water use allocations and enforce them.
- Offer incentives to private landowners not to convert their lands to agriculture.
- Develop programs to acquire more conservation easements as advisable and possible.
- Develop practices that provide benefits to landowners and to wildlife.
- Encourage ranchers to consider long term over short-term benefits.
- Increase personnel in the field to expand the contacts between natural resource professionals and landowners.
- Promote and encourage formation of coalitions/associations such as the Comanche Pool Prairie Resource Foundation.
- Explore grass banking as a conservation practice.
- Acquire lands through willing sellers..
- Promote improved water quality standards and minimum desirable stream flows.
- Work with local, state and federal agencies to reduce negative impacts to habitat from their programs.

Issues:

- Structures that alter the water from its natural drainage and flow patterns are preventing water from returning to rivers and streams.
- Bank destabilization caused by man (e.g., construction of reservoirs, clear water releases below reservoirs, artificial flow regime, grazing and farming practices) and some resulting bank stabilization methods are negatively affecting wetlands.

Strategies:

- Promote ecologically sound techniques for flood control, erosion control, nonpoint source pollution control, and bank stabilization, which will provide high aquatic habitat diversity, and determine engineering techniques for preventing monotypic habitats.
- Enhance wetlands and develop riparian buffers to improve fish habitats.

Issue:

- The introduction of Asian clam and other introduced species has had negative impacts on native fish species and habitats.

Strategies:

- Educate the public regarding the importance of keeping invasive species out.
- The Kansas Dept of Wildlife and Parks needs to develop a Sensitive Species Conservation Plan program.
- Study impact of Asian clam and other introduced species on native species.
- Prohibit importation of non-native fish.
- Develop "clean" list of species allowed in Kansas to complement the Lacy Act.
- Expand cooperative programs that supply technical and direct assistance for nuisance animal control problems and efforts.
- Develop plans to prevent the invasion of exotic fish such as round gobies, *Neogobius melanostomus*, European ruffe, *Gymnocephalus cernuus*, and black carp, *Mylopharyngodon piceus* .

Issue.

- There is a lack of data on species present, and habitat needs.

Strategies:

- Conduct wildlife surveys.
- Conduct studies of habitat needs of species that inhabit the area.
- Conduct studies on habitat quality and quantity.
-

Issue:

- The water laws need to be updated.

Strategies:

- Encourage appreciation for public streams and rivers; educate landowners of the importance of streams and rivers.
- Change the water laws to allow conservation without losing water rights.
- Investigate water banking and tax credits.
- Provide incentives to promote recharge to aquifers.

Issue:

- Fisheries management as it relates to stocking game fish can be detrimental to native species.

Strategies:

- Develop a "clean" list of species allowed in Kansas to complement the Lacy Act.

Monitoring for the Aquatic – Western Lotic (flowing water) Habitat

- Monitor the number of landowners who sign-up in various programs.
- Identify the number of Better Management Practices developed and implemented and monitor periodically.
- Identify the number of acres in conservation easement and monitor periodically.
- Monitor changes in number of landowners using best management practices.
- Monitor number of acres acquired to conserve the rivers.

- ♦ Implement attitude/knowledge surveys of landowners and managers about best management practices and wildlife and repeat periodically.
- ♦ Develop baseline information on species, habitats and interactions as a starting point; reassess every 5-10 years.
- ♦ Use GIS as a tool to measure land use changes
- ♦ Use data developed from cooperative ventures.
- ♦ Implement attitude/knowledge surveys of general public and K-12 students and repeat periodically.
- ♦ Implement water quality and quantity monitoring programs.
- ♦ Identify and monitor change over time of the number of water rights retired or purchased.
- ♦ Continue annual population surveys of fish and aquatic species.
- ♦ Track fish kills – monitor trends.
- ♦ Kansas Dept. of Health and Environment, Kansas Biological Survey Bio Survey, and others need to coordinate their databases.
- ♦ Periodically update the "Clean List" of species allowed in Kansas to complement the Lacy Act.
- ♦ Implement and update invasive species plans.
- ♦ Identify and monitor change overtime of the number of river bank protection projects.

Seeps and Springs Habitat

The quality and quantity trends for this habitat are declining.

The Species of Greatest Conservation Need for the Seeps and Springs Habitat are listed on Table 8. They are ranked into tiers. This process is shown in detail in Appendix 1 "Kansas' Species of Greatest Conservation Need – Selection and Ranking". This ranking established a baseline against which future evaluations and monitoring can be compared, on a species basis. It will also be used to prioritize research and survey proposals.

Table 8. Central Mixed Grass Prairie Conservation Region
Seeps and Springs
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Fish	Arkansas Darter (T)	*Etheostoma cragini*	14	I
Reptiles	Checkered Garter Snake (T)	*Thamnophis marcianus*	11	I
Insect	Austin Springfly	*Hydroperla fugitans*	11	I
Amphibians	Strecker's Chorus Frog (T)	*Pseudacris streckeri*	10	II
Amphibians	Northern Cricket Frog	*Acris crepitans*	10	II
Amphibians	Red-spotted Toad	*Bufo punctatus*	10	II
Isopods	A Cave Isopod	*Caecidotea metcalfi*	10	II

(T) means State Threatened (Federal threatened are included)
(E) means State Endangered (Federal endangered are included)
(X) means extirpated

Issues and Strategies: for the Seeps and Springs Habitat

The issues, with their accompanying strategies, are listed in general priority order.

Issue:

▶ Seeps and springs are being harmed by agricultural practices.

Strategies:

- Develop and implement public information and education programs.
- Encourage conservation easements and use of Wetland Reserve programs.
- Research and investigate best management practices.
- Work with the county zoning boards to implement good planning procedures.
- Offer incentives to landowners not to sell land for private development.
- Develop plots to demonstrate best management practices on public and private lands.
- Offer incentives to private landowners not to convert seeps and springs to agriculture uses.

Issue:

▶ Pollution from point and non-point sources is having a negative impact on the flora and fauna of seeps and springs.

Strategies:

- Investigate effects of pesticides/herbicides (unintended consequences) and develop management options.
- Offer incentives for constructing fences around seeps and springs to keep livestock out.
- Plant vegetation strips or buffers around seeps and springs to reduce siltation and filter pollutants.
- Promote ecologically sound techniques for flood control, erosion control, non-point source pollution control, and bank stabilization, which will provide high aquatic habitat diversity, and determine engineering techniques for preventing monotypic habitats.

Issue:

▶ Invasive plants, especially woody species, are having a negative impact on the Seeps and Springs Habitat.

Strategies:

- Research and investigate best management practices to control woody invasive species.
- Control woody invasive species and exotics with prescribed burning and by mechanical means.
- Promote appropriate use of fire to control woody invasive species.
- Promote mechanical control for woody invasive species.
- Provide financial incentives to control woody invasive species.
- Inform landowners and public about the need for and the techniques to control woody invasive species.

- Implement procedures to discourage planting of invasive species and to encourage planting appropriate species.
- Develop plots to demonstrate best management practices on public and private lands.
- Develop a state invasive species plan.

Issue:

► There is a lack of data on species present, and habitat needs.

Strategies:

- Conduct wildlife surveys.
- Conduct studies of habitat needs of species that inhabit the area.
- Conduct studies on habitat quality and quantity.

Issues:

Water Problems:

► The decline of the water table is having negative impacts on the Seeps and Springs Habitat.

► The use of water from seeps and springs for irrigation is having a negative impact.

Strategies:

- Inform and promote with landowners and managers the benefits and proper use of fire.
- Inform and promote proper grazing practices with landowners and managers.
- Research and develop engineering techniques for effective wetland seeps and springs management.
- Acquire rare, critical and/or important habitats and wetlands from willing sellers.
- Acquire water rights for seeps and springs where advisable and possible.
- Maximize habitat diversity on seeps and springs for wildlife species.
- Work with neighboring states to gain compliance of interstate compacts.
- Acquire water rights.
- Develop appropriate water use allocations and enforce them.
- Offer incentives to private landowners not to convert their lands to agriculture.
- Expand the Grassland Reserve Program.
- Develop programs to acquire more conservation easements as advisable and possible.
- Expand the Sod Buster program.
- Develop practices that provide benefits to landowners and to wildlife.
- Encourage ranchers to consider long term over short term benefits.
- Increase personnel in the field in order to expand the contacts between natural resource professionals and landowners.
- Promote and encourage formation of coalitions/associations such as the Comanche Pool Prairie Resource Foundation.
- Explore grass banking as a conservation practice.
- Acquire lands as appropriate for conservation of sensitive habitats and species.

Monitoring for the Seeps and Springs Habitat

♦ Monitor the number of landowners who sign-up in various programs.

- Identify the number of Better Management Practices developed and implemented and monitor periodically.
- Identify the number of acres in conservation easement and monitor periodically.
- Monitor changes in number of landowners using best management practices.
- Monitor number of seeps and springs acquired for conservation.
- Implement attitude/knowledge surveys of landowners and managers about best management practices and wildlife and repeat periodically.
- Develop baseline information on species, habitats and interactions as a starting point; reassess every 5-10 years.
- Use GIS as a tool to measure land use changes.
- Use data developed from cooperative ventures.
- Implement attitude/knowledge surveys of general public and K-12 students and repeat periodically.
- Implement water quality and quantity monitoring programs.
- Identify and monitor change over time of the number of water rights for seeps and springs that are retired or purchased.
- Track fish kills – monitor trends.
- Kansas Dept. of Health and Environment, Kansas Biological Survey Bio Survey, and others need to coordinate their databases.
- Monitor the change in the number of seeps and springs conserved from encroachment and the number of wetlands managed through fencing, buffers, etc..
- Monitor the change in the acres of woody invasive species.
- Implementation of state invasive species plan.

Aquatic – Eastern Large Rivers Habitat

The Aquatic – Eastern Large Rivers Habitat is the portion of the Arkansas and the Kansas Rivers that flow through the Central Mixed Grass Conservation Region. The quality and quantity trends for this habitat are declining

The Species of Greatest Conservation Need for the Aquatic – Eastern Large Rivers Habitat are listed on Table 9. They are ranked into tiers. This process is shown in detail in Appendix 1 "Kansas' Species of Greatest Conservation Need – Selection and Ranking". This ranking established a baseline against which future evaluations and monitoring can be compared, on a species basis. It will also be used to prioritize research and survey proposals.

Table 9. Central Mixed Grass Conservation Region
Aquatic-Eastern Large Rivers
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Fish	Sturgeon Chub (T)	*Macrhybopsis gelida*	14	I
Fish	Arkansas River Shiner (X) (E)	*Notropis girardi*	13	I
Fish	Western Silvery Minnow (T)	*Hybognathus argyritis*	13	I
Fish	Plains Minnow	*Hybognathus placitus*	13	I
Fish	Flathead Chub (T)	*Platygobio gracilis*	12	I

Table 9. Central Mixed Grass Conservation Region
Aquatic-Eastern Large Rivers
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Birds	Piping Plover (T)	*Charadrius melodius*	12	I
Birds	Stilt Sandpiper	*Calidris himantopus*	12	I
Birds	Least Tern (E)	*Sterna antillarum*	12	I
Turtles	Alligator Snapping Turtle	*Macrochelys temminckii*	12	I
Mussels	Fluted-Shell (T)	*Lasmigona costata*	12	I
Fish	Chestnut Lamprey (T)	*Ichthyomyzon castaneus*	12	I
Fish	Brassy Minnow	*Hybognathus hankinsoni*	12	I
Fish	Shoal Chub	*Macrhybopsis hyostoma*	11	I
Birds	Black-crowned Night-Heron	*Nycticorax nycticorax*	11	I
Fish	Quillback	*Carpiodes cyprinus*	11	I
Mussels	Yellow Sandshell	*Lampsilis teres*	11	I
Birds	Forster's Tern	*Sterna forsteri*	11	I
Fish	River Shiner	*Notropis blennius*	11	I
Fish	Silver Chub (E)	*Macrhybopsis storeriana*	11	I
Birds	Black Tern	*Chlidonias niger*	11	I
Gastropods	Sharp Hornsnail (T)	*Pleurocera acuta*	11	I
Birds	Little Blue Heron	*Egretta caerulea*	11	I
Fish	Common Shiner	*Luxilus cornutus*	11	I
Fish	Black Buffalo	*Ictiobus niger*	10	II
Mussels	Wabash Pigtoe	*Fusconaia flava*	10	II
Fish	White Sucker	*Catostomus commersonii*	10	II
Mussels	Fawnsfoot	*Truncilla donaciformis*	10	II
Birds	Least Sandpiper	*Calidris minutilla*	10	II
Mussels	Pistolgrip	*Tritogonia verrucosa*	10	II
Amphibians	Northern Cricket Frog	*Acris crepitans*	10	II
Birds	Baird's Sandpiper	*Calidris bairdii*	10	II
Birds	Bald Eagle (T)	*Haliaeetus leucocephalus*	10	II
Birds	Northern Pintail	*Anas acuta*	10	II
Birds	Great Egret	*Ardea alba*	10	II
Mussels	White Heelsplitter	*Lasmigona complanata*	9	III
Fish	Golden Redhorse	*Moxostoma erythrurum*	9	III
Fish	Shorthead Redhorse	*Moxostoma macrolepidotum*	9	III
Birds	White-rumped Sandpiper	*Calidris fuscicollis*	9	III
Crustaceans	A Crayfish	*Orconectes neglectus*	9	III
Birds	American White Pelican	*Pelecanus erythrorhynchos*	9	III
Birds	Snowy Egret	*Egretta thula*	9	III
Mussels	Creeper	*Strophitus undulatus*	9	III
Turtles	Smooth Softshell	*Apalone mutica*	9	III
Mussels	Pondmussel	*Ligumia subrostrata*	9	III
Mussels	Pimpleback	*Quadrula pustulosa*	9	III
Fish	Logperch	*Percina caprodes*	8	III
Mussels	Mapleleaf	*Quadrula quadrula*	8	III
Mussels	Giant Floater	*Pyganodon grandis*	8	III
Fish	Orangethroat Darter	*Etheostoma spectabile*	8	III

Table 9. Central Mixed Grass Conservation Region Aquatic-Eastern Large Rivers Species of Greatest Conservation Need				
Group	**Common Name**	**Scientific Name**	**Total**	**Tier**
Fish	Stonecat	*Noturus flavus*	8	III
Mussels	Pink Papershell	*Potamilus ohiensis*	7	III
Mussels	Fragile Papershell	*Leptodea fragilis*	7	III

(T) means State Threatened (Federal threatened are included)
(E) means State Endangered (Federal endangered are included)
(X) means extirpated

Issues and Strategies: for the Aquatic - Eastern Large Rivers Habitat

The issues, with their accompanying strategies, are listed in general priority order.

Issue:
Water Problems

- The use of water from rivers for irrigation, industries and municipalities is having a negative impact.

Strategies:

- Inform and promote proper agricultural practices with landowners and managers.
- Research and develop engineering techniques for effective water management.
- Acquire rare, critical and/or important habitats through willing sellers.
- Acquire water rights as advisable and possible.
- Work with neighboring states to gain compliance of interstate compacts.
- Develop appropriate water use allocations and enforce them.
- Develop program to acquire more conservation easements as advisable and possible.
- Develop best management practices that provide benefits to landowners and to wildlife.
- Encourage ranchers/farmers to consider long term over short-term benefits.
- Increase personnel in the field in order to expand the contacts between natural resource professionals and landowners.
- Promote and encourage formation of coalitions/associations such as The Comanche Pool Prairie Resource Foundation.
- Acquire lands as appropriate for conservation of sensitive habitats and species through willing sellers.

Issue:

- The introduction of non-native fish and/or aquatic nuisance species can have negative impacts on native fish species and habitats.

Strategies:

- Educate public about the importance of keeping invasive species out.
- Study impact of bighead carp and other introduced species on native species.
- Prohibit importation of non-native fish.
- Develop ‘clean list’ of species allowed in Kansas to complement the Lacy Act.

- The Kansas Department of Wildlife and Parks needs to develop a Sensitive Species Conservation Plan program.
- Expand cooperative programs that supply technical and direct assistance for nuisance animal control problems and efforts.
- Develop plans to prevent the invasion of exotic fish such as round gobies, *Neogobius melanostomus*, European ruffe, *Gymnocephalus cernuus*, and black carp, *Mylopharyngodon piceus*
- Encourage closer management of the aquaculture industry in Kansas and other related industries (e.g., commercial fishermen, pet industry).
- Enforce illegal stocking regulations.
- Kansas Dept. of Wildlife and Parks needs to work with other states and federal agencies to gain assurance that no invasive species are being transported in Kansas.

Issue:

▶ There is a lack of data on species present, and habitat needs.

Strategies:

- Conduct wildlife surveys.
- Conduct studies of habitat needs of species that inhabit the area.
- Conduct studies on habitat quality and quantity.

Issues:

Pollution

▶ Animal feeding operations near rivers and streams have negative impacts on water quality.

▶ The outflow from the sewage plants and the storm sewers of cities and towns have negative impacts on the water quality of rivers and streams.

Strategies:

- Monitor impacts to fisheries from pollution sources.
- Identify pollution problem areas and improve conditions detrimental to biodiversity and endangered species.
- Identify sources and impacts, and educate landowners, local officials and the general public.
- Encourage strengthening of pollutions laws.
- Promote sound water quality standards and their enforcement through education and continued coordination with the Kansas Department of Health and Environment, relating the standards to stream ratings, dependent on the presence of rare fishes, unique assemblages, or high biodiversity.
- Administer minimum desirable stream-flows.
- Improve feedlot pollution management regulations.

Monitoring for the Aquatic – Eastern Large Rivers Habitat

♦ Monitor the number of landowners who sign-up in various programs.

♦ Identify the number of Better Management Practices developed and implemented and monitor periodically.

♦ Identify the number of acres in conservation easements and monitor periodically.

- ♦ Monitor changes in number of landowners using best management practices.
- ♦ Monitor the number of acres acquired that conserve river habitats.
- ♦ Implement attitude/knowledge surveys of landowners and managers about best management practices and wildlife and repeat periodically.
- ♦ Implement attitude/knowledge surveys of general public and K-12 students and repeat periodically.
- ♦ Gather baseline information on species, habitats and interactions.
- ♦ Develop baseline information on species, habitats and interactions as a starting point; reassess every 5-10 years.
- ♦ Use GIS as a tool to measure land use changes.
- ♦ Use data developed from cooperative ventures.
- ♦ Implement water quality and quantity monitoring programs.
- ♦ Identify and monitor the number of greenway or wildlife corridors along the rivers.
- ♦ Monitor the number of wetlands conserved (e.g., fenced, buffered, etc.).
- ♦ Monitor the number of water rights retired or purchased in the watershed.
- ♦ Conduct annual population surveys of fish and aquatic species.
- ♦ Track fish kills – monitor trends.
- ♦ Coordinate the databases of Kansas Dept. of Health and Environment, Kansas Biological Survey's Bio Survey, and others and use as a monitoring tool.
- ♦ Periodically update the "Clean List" of species allowed in Kansas.
- ♦ Implement and update invasive species plans.

Potential Partners for the Central Mixed Grass Conservation Region

- American Association of Retired Persons
- American Fisheries Society
- Basin advisory committees
- Bass Angler's Sportsmen Society
- Bureau of Reclamation
- Cabela's
- Central Plains Society of Mammalogists
- County conservation districts
- Ducks Unlimited
- Farm Services Agency
- Geary Co Fish and Game Association
- Great Plains Nature Center
- Individual Audubon chapters
- Kansas Association of Counties
- Kansas Association for Conservation and Environmental Education
- Kansas Alliance of Wetland and Streams
- Kansas Academy of Science
- Kansas Biological Survey
- Kansas Dept. of Agriculture.
- Kansas Dept. of Health and Environment

- Kansas Dept. of Transportation
- Kansas Farm Bureau
- Kansas Forest Service
- Kansas Geological Survey
- Kansas Livestock Association
- Kansas Native Plants Society
- Kansas National Education Association
- Kansas Ornithological Society
- Kansas Section of Society for Range Management
- Kansas Water Authority
- Kansas Wildlife Federation
- Kansas Water Office
- Konza Environmental Education Program
- Landowners
- League of Municipalities
- Local governments
- Local media
- National Wild Turkey Federation
- National Rifle Association
- Natural Resource Conservation Service
- Pheasants Forever
- Playa Lakes Joint Venture
- Private Corporations (Boeing, Westar, Vulcan)
- Quail Unlimited
- Rolling Hills Zoo
- Silver Haired Legislature
- State Conservation Commission
- State legislators
- The Nature Conservancy
- Travel Industry Association of Kansas
- Tourism industry
- Universities
- US Environment Protection Agency
- US Fish and Wildlife Service
- US Geological Survey
- US Army Corps of Engineers
- US Dept. of Interior
- Watershed Associations

Eastern Tallgrass Prairie Conservation Region

The Eastern Tallgrass Prairie Conservation Region is located in the eastern third of Kansas. It includes the physiographic regions of the Flint Hills Uplands, Osage Cuesta, the Glaciated Region, Chautauqua Hills, the Cherokee Lowlands, and the Ozark Plateau. The western portion is mostly prairie, while the eastern portion is a mixture of prairie, woodlands and forests. The normal annual rainfall is between 30 and 42 inches. Some common grasses of the prairie are big bluestem (*Andropogon gerardii*), yellow Indian grass (*Sorghastrum nutans*), little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicumvirgatum*), prairie dropseed (*Sporobolus heterolepis*), and porcupine grass (*Hesperostipa spartea*). The most common forest type in the Deciduous Forest habitat is oak (*Quercus spp.)*/hickory (*Carya spp*.).
Some of the rivers of the conservation region are the Kansas, Neosho, Marais des Cygnes and the Verdigris. Eastern cottonwood (*Populus deltoides*), hackberry (*Celtis occidentalis*), American elm (*Ulmus Americana*), and green ash (*Fraxinus pennsylvannica*) are common species in the flood plains along the rivers. Crop production, grazing, and CRP are common agricultural practices.

The habitats for the Eastern Tallgrass Prairie Conservation Region are listed in general priority order. The key habitats are identified with an asterisk (*).

Tallgrass Prairie*
Herbaceous Wetland*
Aquatic-eastern streams/small rivers*
Deciduous Forest*
Aquatic – eastern large rivers*
Deciduous Floodplain*
Evergreen (Cedar)
CRP/Native
CRP/Cool Season
Cropland
Urban Areas
Caves
Aquatic – eastern lentic (still waters)
Seeps and Springs

Tallgrass Prairie Habitat

Tallgrass Prairie Habitat is a core habitat that is in need of special emphasis. The relative quality and quantity of the Tallgrass Prairie Habitat is declining. This habitat includes the Kansas GAP Tallgrass Prairie *Andropogon gerardii* - (*Sorghastrum nutans*) Herbaceous Alliance and the Sandstone Glade/Prairie *Schizachyrium scoparium - Sorghastrum nutans* Herbaceous Alliance. The largest remaining undisturbed tracts of the habitat occur in the Flint Hill Uplands.

The Species of Greatest Conservation Need for the Tallgrass Prairie Habitat are listed in table 10. They are ranked into tiers. This process is shown in detail in Appendix 1 "Kansas' Species of Greatest Conservation Need – Selection and Ranking". This ranking established a baseline against which future evaluations and monitoring can be compared, on a species basis. It will also be used to prioritize research and survey proposals.

Table 10. Eastern Tallgrass Prairie Conservation Region
Tallgrass Prairie Habitat
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Birds	Henslow's Sparrow	*Ammodramus henslowii*	15	I
Insect	Prairie Mole Cricket	*Gryllotalpa major*	14	I
Insect	A Mayfly (From Ks.)	*Leptophlebia konza*	14	I
Birds	Baird's Sparrow	*Ammodramus bairdii*	13	I
Insect	American Burying Beetle (E)	*Nicrophorus americanus*	13	I
Birds	Loggerhead Shrike	*Lanius ludovicianus*	13	I
Mammals	Spotted Skunk (T)	*Spilogale putorius*	12	I
Birds	Greater Prairie-Chicken	*Tympanuchus cupido*	12	I
Birds	Sprague's Pipit	*Anthus spragueii*	12	I
Birds	Bobolink	*Dolichonyx orzivorus*	12	I
Reptiles	Timber Rattlesnake	*Crotalus horridus*	12	I
Amphibians	Crawfish Frog	*Rana areolata*	12	I
Mammals	Southern Bog Lemming	*Synaptomys cooperi*	11	I
Birds	Swainson's Hawk	*Buteo swainsoni*	11	I
Birds	American Golden-Plover	*Pluvialis dominica*	11	I
Birds	Short-eared Owl	*Asio flammeus*	11	I
Birds	Common Poorwill	*Phalaenoptilus nuttallii*	11	I
Insect	Austin Springfly	*Hydroperla fugitans*	11	I
Birds	Bell's Vireo	*Vireo bellii*	11	I
Mammals	Franklin's Ground Squirrel	*Spermophilus franklinii*	11	I
Birds	Smith's Longspur	*Calcarius pictus*	11	I
Reptiles	Eastern Hognose Snake	*Heterodon platirhinos*	10	II
Mammals	Texas Mouse	*Peromyscus attwateri*	10	II
Birds	Eastern Meadowlark	*Sturnella magna*	10	II
Reptiles	Western Hognose Snake	*Heterodon nasicus*	10	II
Birds	Dickcissel	*Spiza americana*	10	II
Amphibians	Northern Cricket Frog	*Acris crepitans*	10	II
Insect	Byssus Skipper	*Problema byssus*	10	II
Birds	Upland Sandpiper	*Bartramia longicauda*	10	II
Amphibians	Eastern Narrowmouth Toad (T)	*Gastrophryne carolinensis*	10	II
Birds	Common Nighthawk	*Chordeiles minor*	10	II
Insect	Ottoe Skipper	*Hesperia ottoe*	10	II
Reptiles	Massasauga	*Sistrurus catenatus*	10	II
Insect	Regal Fritillary	*Speyeria idalia*	10	II
Birds	Brown Thrasher	*Toxostoma rufum*	10	II
Birds	Lark Sparrow	*Chondestes grammacus*	10	II
Reptiles	Texas Horned Lizard	*Phrynosoma cornutum*	10	II
Birds	Grasshopper Sparrow	*Ammodramus savannarum*	10	II
Insect	Mottled Duskywing	*Erynnis martialis*	10	II

Table 10. Eastern Tallgrass Prairie Conservation Region Tallgrass Prairie Habitat Species of Greatest Conservation Need				
Group	**Common Name**	**Scientific Name**	**Total**	**Tier**
Birds	Scissor-tailed Flycatcher	*Tyrannus forficatus*	10	II
Insect	Arogos Skipper	*Atrytone arogos*	10	II
Insect	Monarch	*Danaus plexippus*	9	III
Crustaceans	A Crayfish	*Orconectes nais*	9	III
Birds	Mississippi Kite	*Ictinia mississippiensis*	9	III
Birds	Northern Bobwhite	*Colinus virginianus*	9	III
Birds	Red-headed Woodpecker	*Melanerpes erythrocephalus*	9	III
Birds	Western Kingbird	*Tyrannus verticalis*	9	III
Birds	American Tree Sparrow	*Spizella arborea*	9	III
Birds	Field Sparrow	*Spizella pusilla*	9	III
Birds	Harris' Sparrow	*Zonotrichia querula*	9	III
Amphibians	Eastern Tiger Salamander	*Ambystoma tigrinum*	9	III
Birds	Eastern Kingbird	*Tyrannus tyrannus*	9	III
Crustaceans	Virile Crayfish	*Orconectes virilis*	8	III
Reptiles	Milk Snake	*Lampropeltis triangulum*	8	III
Reptiles	Rough Green Snake	*Opheodrys aestivus*	8	III

(T) means State Threatened (Federal threatened are included)
(E) means State Endangered (Federal endangered are included)
(X) means extirpated

Issues and Strategies: for the Tallgrass Prairie Habitat

The issues, with their accompanying strategies, are listed in general priority order.

Issues:

Native Habitat Management

- Overgrazing has negative impacts on the flora and fauna of the Tallgrass Prairie.
- Annual burning has negative impacts on the flora and fauna.
- Some management practices on public and private lands have negative impacts on the Tallgrass Prairie flora and fauna.
- Data are incomplete about species populations, distribution and habitat needs.
- The public needs to be better informed about wildlife and outdoor recreation to support the needs of all wildlife species and habitats.
- Lack of properly applied prescribed burning has negative impacts on habitat due to encroachment of woody species.

Strategies:

- Educate public officials at all levels and their staffs.
- Develop an information and education program for property owners, managers and local officials.
- Develop information and education programs for the general public.
- Work with other state and federal agencies to reduce impacts to habitat resulting from their programs and provide more education for respective employees.
- Hold state-wide symposia to present the best science available related to tree planting and management and to provide dialogue opportunity among agencies and organizations.

- Conduct a multi-agency/organization educational/media effort to help disseminate information and to identify opportunities for a consensus of actions needed.
- Promote research on economic impacts of rotational burning.
- Implement controls for woody invasive species.
- Implement rotational burning and grazing practices to create a mosaic of habitats.
- Identify cost effective best management practices.
- Explore incentive programs to implement the best management practices.
- Promote rangeland management tools, such as controlling invasive species and rotational burning/grazing.
- Develop partnerships in core grassland areas..
- Support economic uses of the tallgrass prairie that maintain wildlife functions.
- Change ranking criteria by U.S. Dept. of Agriculture to help favor beneficial management.
- Increase funding for Grassland Reserve Program and conservation easements to reverse trend of conversion of grassland to cropland, targeting efforts toward habitat that is being degraded.
- Encourage the Kansas GAP Analysis Program and the Forest Inventory and Analysis Program to work together in providing data to determine how forest resources keep common species common.
- Promote the practice of prescribed burning to control the encroachment of woody species.
- Work with other state agencies, such as the Kansas Department of Transportation, to avoid, minimize, reduce and mitigate impacts to habitat resulting from their programs.

Issues:

Fragmentation/Habitat Loss

- ▶ The increase of urban, suburban and rural homes is reducing native habitat.
- ▶ Wind farm placement and operations could cause negative impacts on flora and fauna.
- ▶ Conversion of existing habitat to croplands is destroying native flora and reducing the habitat for wildlife.

Strategies:

- Develop and implement statewide education about the importance of tall grass habitat.
- Educate decision makers at all levels.
- Educate private landowners to encourage appreciation of tall grass habitat.
- Implement a conservation easement program.
- Identify vulnerable prairie habitat.
- Acquire land as appropriate and through willing sellers to conserve sensitive habitat and species.
- Take steps to restore the prairie to its native species and function.
- Work with local zoning authorities to reduce the impacts of wind farms and urbanization.
- Develop partnerships to help private landowners conduct controlled burns, providing education, equipment, expert advice and assistance.
- Develop management tools specifically designed for small landowners.

- Identify core grasslands at the state level.
- Revitalize cities to prevent urban sprawl.
- Regulate wind energy at state level rather than county.
- Develop wildlife corridors.

Issues:

Invasive Species

- ▶ Invasive species are rapidly spreading. They pose a serious threat to the biodiversity of Kansas' remaining tallgrass prairie through competitive interaction with native species.
- ▶ The widespread broadcast spraying of herbicides in an effort to control invasive species harms native species.

Strategies:

- Educate the general public/gardeners about the impact of exotic species (plants and animals) that might be imported.
- Educate landowners, managers, local officials and the general public on preventing the spread of existing infestations of invasive species.
- Educate the public on the impacts of brome and fescue species.
- Implement research on effective methods to control plants.
- Research invasive species biology.
- Assess risk of invasive species.
- Conduct research on alternative management techniques to control invasive species.
- Follow-up on the effects of biological controls for invasive species.
- Develop rules and guidelines that are effective, but also have the flexibility needed to resolve problems in the field.
- Work with Kansas Dept. of Transportation to determine appropriate species to plant along roads.
- Improve cooperation with public agencies in neighboring states.
- Develop the necessary environmental safeguards for chemical application programs.
- Establish a state environmental policy act.
- Encourage the use of private contractors for grassland management.
- Develop a state invasive plant and animal plan.
- Provide landowners monetary incentives to control invasive species.
- Develop an invasive species task force to develop management plans.
- Provide technical assistance and training to private and public landowners.
- Solicit additional funds for invasive species management.
- Promote and fund research and management to control invasive species that doesn't sacrifice native plant diversity.
- Continue as an active partner with the Lespedeza Working Group.
- Be proactive toward threats of future invasive species.
- Control invasive species through proper selection and application methods.

Issue.

- ▶ There is a lack of data on species present, and habitat needs.

Strategies::

- Conduct wildlife surveys.
- Conduct studies of habitat needs of species that inhabit the area.

- Conduct studies on habitat quality and quantity.

Monitoring for the Tallgrass Prairie Habitat

- ♦ Establish a baseline for what constitutes a healthy grassland community.
- ♦ Use GIS to track invasive species.
- ♦ Monitor the impact of invasive species on wildlife populations.
- ♦ Develop and implement techniques of monitoring invasive species that can be used by laymen.
- ♦ Use Kansas Dept. of Agriculture surveys to monitor habitat and land use change over time.
- ♦ Implement population studies and surveys and identify suitable indicator species.
- ♦ Collect demographic data to determine human impacts.
- ♦ Develop baseline data for habitat quality and quantity.
- ♦ Implement long term monitoring of baseline data.
- ♦ Conduct additional public and private landowner surveys of current management practices and repeat periodically as needed and related to the existing Forest Inventory and Analysis Program.
- ♦ Produce GIS mapping with layers for wetlands, riparian areas, sensitive areas, public ownership, breeding bird data, fish and wildlife distribution and abundance, species ranges and aquatic habitat parameters, and incorporate with GAP.
- ♦ Periodically update the Kansas Breeding Bird Atlas.
- ♦ Use the Natural Resource Conservation Service ecological rangeland procedures for assessments.
- ♦ Continue/expand current Kansas Dept. of Wildlife and Parks population surveys.
- ♦ Institute a wetland inventory and repeat periodically.
- ♦ Support and participate in the annual Forest Inventory and Analysis Program.
- ♦ Monitor the Natural Resource Inventory.
- ♦ Conduct prescribed burning surveys.

Herbaceous Wetland Habitat

The Herbaceous Wetland habitat in the Eastern Tallgrass Prairie Conservation Region is comprised of the KS-GAP Wetland Alliances habitats of Low or Wet Prairie, Freshwater Marsh, Cattail Marsh, and Weedy Marsh. The quality and quantity trends for this habitat are both unknown. They are located in the floodplains along rivers and stream, in swales associated with rivers, or as margins of lakes and impoundments. These are mostly seasonal and permanent wetlands. The dominant species are:

Scirpus validus - Softstem Bulrush
Typha spp. - Cattails
Scirpus spp. - Bulrushes
Ambrosia spp. - Ragweeds
Rumex spp. - Sorrel
Spartina pectinata - Prairie Cordgrass
Eleocharis spp. - Spike Rush
Carex spp. - Sedges

The Species of Greatest Conservation Need for the Herbaceous Wetland Habitat are listed in table 11. They are ranked into tiers. This process is shown in detail in

Appendix 2 “Kansas’ Species of Greatest Conservation Need – Selection and Ranking”. This ranking established a baseline against which future evaluations and monitoring can be compared, on a species basis. It will also be used to prioritize research and survey proposals.

Table 11. Eastern Tallgrass Prairie Conservation Region Herbaceous Wetland Habitat Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Birds	Snowy Plover (T)	*Charadrius alexandrinus*	14	I
Birds	Hudsonian Godwit	*Limosa haemastica*	13	I
Birds	Baird's Sparrow	*Ammodramus bairdii*	13	I
Birds	Rusty Blackbird	*Euphagus carolinus*	13	I
Birds	Eskimo Curlew (E)	*Numenius borealis*	13	I
Birds	Piping Plover (T)	*Charadrius melodius*	12	I
Birds	Whooping Crane (E)	*Grus americana*	12	I
Birds	Black-billed Cuckoo	*Coccyzus erythropthalmus*	12	I
Birds	Stilt Sandpiper	*Calidris himantopus*	12	I
Birds	Black-bellied Plover	*Pluvialis squatarola*	12	I
Amphibians	Crawfish Frog	*Rana areolata*	12	I
Birds	Bobolink	*Dolichonyx orzivorus*	12	I
Birds	Least Tern (E)	*Sterna antillarum*	12	I
Birds	Peregrine Falcon (E)	*Falco peregrinus*	12	I
Birds	Long-billed Dowitcher	*Limnodromus scolopaceus*	11	I
Birds	Buff-breasted Sandpiper	*Tryngites subruficollis*	11	I
Birds	Black Tern	*Chlidonias niger*	11	I
Birds	American Golden-Plover	*Pluvialis dominica*	11	I
Birds	Forster's Tern	*Sterna forsteri*	11	I
Birds	Swainson's Hawk	*Buteo swainsoni*	11	I
Birds	Pectoral Sandpiper	*Calidris melanotos*	11	I
Birds	Brewer's Blackbird	*Euphagus cyanocephalus*	11	I
Birds	Black-crowned Night-Heron	*Nycticorax nycticorax*	11	I
Reptiles	Redbelly Snake (T)	*Storeria occipitomaculata*	11	I
Birds	Little Blue Heron	*Egretta caerulea*	11	I
Mammals	Southern Bog Lemming	*Synaptomys cooperi*	11	I
Gastropods	Slender Walker Snail (E)	*Pomatiopsis lapidaria*	11	I
Mussels	Flat Floater	*Anodonta suborbiculata*	11	I
Birds	Short-eared Owl	*Asio flammeus*	11	I
Birds	Northern Pintail	*Anas acuta*	10	II
Birds	Bald Eagle (T)	*Haliaeetus leucocephalus*	10	II
Birds	American Bittern	*Botaurus lentiginosus*	10	II
Birds	Great Egret	*Ardea alba*	10	II
Mammals	Fulvous Harvest Mouse	*Reithrodontomys fulvescens*	10	II
Amphibians	Northern Cricket Frog	*Acris crepitans*	10	II
Reptiles	Cottonmouth	*Agkistrodon piscivorus*	10	II
Birds	Upland Sandpiper	*Bartramia longicauda*	10	II
Amphibians	Eastern Newt (T)	*Notophtalmus viridescens*	10	II
Reptiles	Massasauga	*Sistrurus catenatus*	10	II
Birds	Greater Yellowlegs	*Tringa melanoleuca*	10	II
Birds	Eastern Meadowlark	*Sturnella magna*	10	II

Table 11. Eastern Tallgrass Prairie Conservation Region Herbaceous Wetland Habitat Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Birds	Lesser Yellowlegs	*Tringa flavipes*	10	II
Amphibians	Eastern Narrowmouth Toad (T)	*Gastrophryne carolinensis*	10	II
Birds	Least Sandpiper	*Calidris minutilla*	10	II
Amphibians	Green Frog (T)	*Rana clamitans*	10	II
Birds	Baird's Sandpiper	*Calidris bairdii*	10	II
Amphibians	Spring Peeper (T)	*Pseudacris crucifer*	9	III
Birds	American White Pelican	*Pelecanus erythrorhynchos*	9	III
Amphibians	Eastern Tiger Salamander	*Ambystoma tigrinum*	9	III
Birds	Semipalmated Sandpiper	*Calidris pusilla*	9	III
Birds	Snowy Egret	*Egretta thula*	9	III
Birds	Canvasback	*Aythya valisineria*	9	III
Birds	Mississippi Kite	*Ictinia mississippiensis*	9	III
Crustaceans	Prairie Crayfish	*Procambarus gracilis*	9	III
Birds	White-rumped Sandpiper	*Calidris fuscicollis*	9	III
Mammals	Swamp Rabbit (X)	*Sylvilagus aquaticus*	8	III
Reptiles	Rough Green Snake	*Opheodrys aestivus*	8	III

(T) means State Threatened (Federal threatened are included)
(E) means State Endangered (Federal endangered are included)
(X) means extirpated

Issues and Strategies: for the Herbaceous Wetland Habitat

The issues, with their accompanying strategies, are listed in general priority order.

Issues:

Lost Acres/Hydrological Changes

- ▶ Wetland habitats in Kansas are being lost.
- ▶ The quality of the wetlands is impacted by hydrological changes in the watersheds.

Strategies:

- Educate public officials at all levels and their staffs.
- Implement education programs on the value of wetlands.
- Research and develop engineering techniques for efficient wetland management.
- Provide landowners incentives to maintain wetlands.
- Provide incentives to retire water rights.
- Implement surveys to quantify current wetlands, and identify priority areas.
- Implement programs to conserve existing wetlands.
- Enhance wetlands and develop riparian buffers to improve fish habitats.
- Acquire rare, critical or important habitats, especially wetlands, through willing sellers.
- Acquire water rights for wetlands as advisable and possible.
- Maximize habitat diversity on wetlands for all wildlife species.

Issue:

Public Acceptance of Wetlands

- ▶ The public is not knowledgeable about the value of wetlands.

Strategies:

- Enhance the development of wildlife teaching materials and programs from K-College for administrators, teacher trainers, and teachers that help link environmental literacy components to existing curriculum standards. This would include teacher workshops on wildlife diversity, with credit for re-certification.
- Supply resources to help expand conservation education workshops for teachers and youth leaders, including efforts with Project Wild, Project Aquatic, Project Wet, and Project Learning Tree. Consider week-long workshops for teacher credit.
- Develop materials and assist universities in the development of curriculum improvements for natural resource professionals. This could include professional training by universities for wildlife professionals
- Provide outdoor education through demonstrations.
- Develop a broad scale education approach and out reach program on the value of wetlands. These programs would be specifically designed to effectively communicate with various publics: landowners, managers, local governments, agricultural industries, and the general public.
- Acquire more sites near urban areas to provide additional programs using landowner-friendly methods.
- Implement tax credits and conservation easement programs.
- Provide economic incentives to landowners for habitat conservation (both terrestrial and aquatic) efforts.

Issues:

Water Quality

- ▶ Water quality is being altered by runoff of pesticides, herbicides and fertilizers.
- ▶ Urbanization is causing accelerated runoff that is not filtered through natural buffers.
- ▶ Land management practices within the watershed are altering water quality.

Strategies:

- Educate public on the importance of water quality.
- Implement an information/education program for landowners and managers about best management practices.
- Conduct research to better understand the impact of road construction and maintenance on wetlands, and develop best management practices.
- Conduct research to better understand the effect of snow removal/salt on wetlands, and develop best management practices.
- Evaluate the impact of agricultural chemicals on water quality, and develop best management practices.
- Evaluate the impact of lawn/garden products on water quality, and develop best management practices.
- Conduct research to understand response of biota to water quality.
- Monitor impacts from pollution sources.
- Identify pollution problem areas and improve conditions detrimental to biodiversity and endangered species
- Investigate ways to improve ground water management.
- Provide economic incentives to those who use best management practices.
- Expand WRAP, Wetland and Riparian Areas Program - Kansas Dept. of Health and Environment.

- Regulate and standardize wetland monitoring programs.
- Improve water quality minimum standards.
- Work with local, state and federal agencies to reduce impact on habitat resulting from their programs.
- Promote ecologically sound techniques for flood control, erosion control, non-point source pollution control, and bank stabilization, which will provide high aquatic habitat diversity, and determine engineering techniques for preventing monotypic habitats.
- Encourage conservation of wetlands through easements – pay landowners.
- Promote grazing strategies that limit livestock access to wetlands.

Issue:
Lack of Funding

▶ There is a lack of funding for the development and restoration of wetlands.

Strategies:

- Educate the public about the value of wetlands so they will support increased funding.
- Support eco-tourism efforts such as the Kansas Nature-based Tourism Alliance.
- Seek out ways to leverage existing funds and search out new funding sources.
- Promote wetland recreation opportunities.

Issue:

▶ There is a lack of data on species present, and habitat needs.

Strategies:

- Conduct wildlife surveys.
- Conduct studies of habitat needs of species that inhabit the area.
- Conduct studies on habitat quality and quantity.

Issues:
Invasive Species

▶ Invasive species are rapidly spreading. They pose a serious threat to the biodiversity of Kansas' remaining herbaceous wetlands through competitive interaction with native species.

▶ The widespread broadcast spraying of herbicides in an effort to control invasive species harms native species.

Strategies:

- Educate the general public/gardeners about the impact of both plants and animals exotic species that might be imported.
- Educate landowners, managers, local officials and the general public on preventing the spread of existing invasive species infestations.
- Implement research on effective methods to manage invasive plants.
- Provide technical assistance and training to private and public landowners.
- Research invasive species biology.
- Conduct research on alternative management techniques to control invasive species.
- Promote and fund research and management to control invasive species that doesn't sacrifice native plant diversity.
- Assess the efficacy of biological controls.

- Develop rules and guidelines that are effective, but have the flexibility needed to resolve problems in the field.
- Improve cooperation with public agencies in neighboring states.
- Develop the necessary environmental safeguards for chemical applications programs.
- Establish a state environmental policy act.
- Develop a state invasive plant and animal plan.
- Provide landowners monetary incentives to manage invasive species.
- Develop an invasive species task force to develop management plans.
- Solicit additional funds for invasive species management.
- Be proactive toward future invasive species.
- Conduct risk assessment of invasive species.
- Manage invasive species through proper selection and application methods.

Issue:
Understanding Wetland Functions
► The functions for wetlands are not well understood.
Strategies:
- Implement educational programs about functional components or wetlands geared toward laymen, landowners and managers.
- Conduct basic research to better define the types and components of wetlands.

Monitoring of Herbaceous Wetland Habitat
♦ Monitor the attendance at demonstration sites.
♦ Monitor funding level increases.
♦ Monitor the legislature's attitude toward wetland habitat.
♦ Generate a map that tracks conserved land areas through easements.
♦ Monitor attitudes of private landowners who are managing wetlands.
♦ Use identifier species (indicator species) to monitor the health of this habitat.
♦ Develop baseline data for habitat quality and quantity.
♦ Implement a long term monitoring program of the baseline data.
♦ Institute a public and private landowner survey of current management practices and repeat periodically.
♦ Collect demographic data and monitor public attitude toward wetlands.
♦ Monitor species vulnerable to land fragmentation and track future changes(s).
♦ Monitor landowners' best management practice's implementation.
♦ Monitor water chemistry and biota.
♦ Track fish kills and monitor trends.
♦ Monitor Kansas Dept. of Health and Environment and Kansas Biological Survey's Bio- Survey data, and coordinate their databases.

Aquatic-Eastern Streams/Small Rivers Habitat

Aquatic-Eastern Streams/Small Rivers Habitat includes the small rivers, streams and their tributaries in the Neosho, Missouri, Verdigris, Eastern Arkansas, Kansas, and Marais des Cygnes River Basins in eastern Kansas. The relative quality and quantity of the Aquatic-Eastern Streams/Small Rivers Habitat is declining.

The Species of Greatest Conservation Need for the Aquatic-Eastern Streams/Small Rivers Habitat are listed in Table 12. They are ranked into tiers. This process is shown in detail in Appendix 1 "Kansas' Species of Greatest Conservation Need – Selection and Ranking". This ranking established a baseline against which future evaluations and monitoring can be compared, on a species basis. It will also be used to prioritize research and survey proposals.

Table 12. Eastern Tallgrass Prairie Conservation Region
Aquatic – Eastern Stream/Small Rivers Habitat
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Mussels	Neosho Mucket (E)	*Lampsilis rafinesqueana*	16	I
Fish	Neosho Madtom (T)	*Noturus placidus*	14	I
Insect	A Mayfly (From Ks.)	*Leptophlebia konza*	14	I
Fish	Topeka Shiner (T)	*Notropis topeka*	14	I
Fish	Arkansas Darter (T)	*Etheostoma cragini*	14	I
Mussels	Western Fanshell (E)	*Cyprogenia aberti*	14	I
Fish	Plains Minnow	*Hybognathus placitus*	13	I
Fish	River Redhorse	*Moxostoma carinatum*	13	I
Fish	Redspot Chub (T)	*Nocomis asper*	13	I
Fish	Cardinal Shiner	*Luxilus cardinalis*	13	I
Mussels	Rabbitsfoot (E)	*Quadrula cylindrica cylindrica*	13	I
Mussels	Butterfly (T)	*Ellipsaria lineolata*	13	I
Insect	Ozark Emerald	*Somatochlora ozarkensis*	13	I
Mussels	Round Pigtoe Mussel	*Pleurobema sintoxia*	13	I
Mussels	Elktoe (E)	*Alasmidonta marginata*	13	I
Turtles	Common Map Turtle (T)	*Graptemys geographica*	12	I
Fish	Northern Hog Sucker	*Hypentelium nigricans*	12	I
Fish	Spotted Sucker	*Minytrema melanops*	12	I
Birds	Stilt Sandpiper	*Calidris himantopus*	12	I
Fish	Southern Redbelly Dace	*Phoxinus erythrogaster*	12	I
Crustaceans	Neosho Midget Crayfish	*Orconectes macrus*	12	I
Fish	Gravel Chub	*Erimystax x-punctatus*	12	I
Mussels	Spike	*Elliptio dilatata*	12	I
Fish	Blackside Darter (T)	*Percina maculata*	12	I
Insect	Gray Petaltail	*Tachopteryx thoreyi*	12	I
Fish	Highfin Carpsucker	*Carpiodes velifer*	12	I
Mussels	Ellipse Mussel (E)	*Venustaconcha ellipsiformis*	12	I
Fish	Stippled Darter	*Etheostoma punctulatum*	12	I
Fish	Greenside Darter	*Etheostoma blennioides*	12	I
Mussels	Fluted-Shell (T)	*Lasmigona costata*	12	I
Mussels	Ouachita Kidneyshell (T)	*Ptychobranchus occidentalis*	12	I
Mussels	Deertoe	*Truncilla truncata*	12	I
Turtles	Alligator Snapping Turtle	*Macrochelys temminckii*	12	I
Fish	Chestnut Lamprey (T)	*Ichthyomyzon castaneus*	12	I
Fish	Spotfin Shiner	*Cyprinella spiloptera*	12	I
Fish	Hornyhead Chub (T)	*Nocomis biguttatus*	12	I
Fish	Banded Sculpin	*Cottus carolinae*	12	I
Insect	Austin Springfly	*Hydroperla fugitans*	11	I
Fish	Black Redhorse	*Moxostoma duquesnei*	11	I
Fish	Tadpole Madtom	*Noturus gyrinus*	11	I

Table 12. Eastern Tallgrass Prairie Conservation Region
Aquatic – Eastern Stream/Small Rivers Habitat
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Fish	Shoal Chub	*Macrhybopsis hyostoma*	11	I
Fish	Bluntnose Darter	*Etheostoma chlorosoma*	11	I
Fish	Blue Sucker	*Cycleptus elongatus*	11	I
Fish	Quillback	*Carpiodes cyprinus*	11	I
Fish	Western Blacknose Dace	*Rhinichthys obtusus*	11	I
Fish	River Shiner	*Notropis blennius*	11	I
Fish	Silver Chub (E)	*Macrhybopsis storeriana*	11	I
Fish	Common Shiner	*Luxilus cornutus*	11	I
Mussels	Flat Floater	*Anodonta suborbiculata*	11	I
Fish	Brindled Madtom	*Noturus miurus*	11	I
Fish	American Eel	*Anguilla rostrata*	11	I
Gastropods	Sharp Hornsnail (T)	*Pleurocera acuta*	11	I
Mussels	Rock-Pocketbook (T)	*Arcidens confragosus*	11	I
Mussels	Yellow Sandshell	*Lampsilis teres*	11	I
Mussels	Fatmucket	*Lampsilis siliquoidea*	11	I
Mussels	Snuffbox (X)	*Epioblasma triquetra*	11	I
Fish	Ozark Minnow	*Notropis nubilus*	11	I
Amphibians	Grotto Salamander (E)	*Typhlotriton spelaeus*	11	I
Birds	Little Blue Heron	*Egretta caerulea*	11	I
Birds	Painted Bunting	*Passerina ciris*	11	I
Birds	Pectoral Sandpiper	*Calidris melanotos*	11	I
Birds	Prothonotary Warbler	*Protonotaria citrea*	11	I
Birds	Black-crowned Night-Heron	*Nycticorax nycticorax*	11	I
Fish	Slough Darter	*Etheostoma gracile*	11	I
Fish	Banded Darter	*Etheostoma zonale*	11	I
Birds	Forster's Tern	*Sterna forsteri*	11	I
Mussels	Black Sandshell (X)	*Ligumia recta*	11	I
Mussels	Mucket (E)	*Actinonaias ligamenta*	11	I
Birds	Long-billed Dowitcher	*Limnodromus scolopaceus*	11	I
Amphibians	Longtail Salamander (T)	*Eurycea longicauda*	10	II
Birds	Greater Yellowlegs	*Tringa melanoleuca*	10	II
Birds	Lesser Yellowlegs	*Tringa flavipes*	10	II
Mussels	Plain Pocketbook	*Lampsilis cardium*	10	II
Fish	Bigeye Shiner	*Notropis boops*	10	II
Mussels	Wabash Pigtoe	*Fusconaia flava*	10	II
Gastropods	Delta hydrobe	*Probythinella emarginata*	10	II
Amphibians	Cave Salamander (E)	*Eurycea lucifuga*	10	II
Amphibians	Oklahoma Salamander (E)	*Eurycea tyenrehsis*	10	II
Mussels	Fawnsfoot	*Truncilla donaciformis*	10	II
Amphibians	Northern Cricket Frog	*Acris crepitans*	10	II
Mussels	Bleufer	*Potamilus purpuratus*	10	II
Mussels	Washboard	*Megalonaias nervosa*	10	II
Mussels	Purple Wartyback	*Cyclonaias tuberculata*	10	II
Fish	Black Buffalo	*Ictiobus niger*	10	II
Fish	Redfin Darter	*Etheostoma whipplei*	10	II
Mussels	Pistolgrip	*Tritogonia verrucosa*	10	II

Table 12. Eastern Tallgrass Prairie Conservation Region
Aquatic – Eastern Stream/Small Rivers Habitat
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Fish	Channel Darter	*Percina copelandi*	10	II
Insect	Ozark Springfly	*Helopicus nalatus*	10	II
Fish	Johnny Darter	*Etheostoma nigrum*	10	II
Amphibians	Green Frog (T)	*Rana clamitans*	10	II
Fish	Speckled Darter	*Etheostoma stigmaeum*	10	II
Birds	Great Egret	*Ardea alba*	10	II
Crustaceans	A Crayfish	*Orconectes luteus*	10	II
Fish	Fantail Darter	*Etheostoma flabellare*	10	II
Crustaceans	A Crayfish	*Orconectes palmeri*	10	II
Fish	White Sucker	*Catostomus commersonii*	10	II
Birds	Northern Pintail	*Anas acuta*	10	II
Birds	Baird's Sandpiper	*Calidris bairdii*	10	II
Mussels	Pink Heelsplitter	*Potamilus alatus*	10	II
Reptiles	Cottonmouth	*Agkistrodon piscivorus*	10	II
Birds	Least Sandpiper	*Calidris minutilla*	10	II
Fish	Least Darter	*Etheostoma microperca*	10	II
Mussels	Threeridge	*Amblema plicata*	9	III
Mussels	Lilliput	*Toxoplasma parvus*	9	III
Mussels	Pondmussel	*Ligumia subrostrata*	9	III
Crustaceans	Calico Crayfish	*Orconectes immunis*	9	III
Crustaceans	A Crayfish	*Orconectes nais*	9	III
Mussels	White Heelsplitter	*Lasmigona complanata*	9	III
Mussels	Creeper	*Strophitus undulatus*	9	III
Birds	Semipalmated Sandpiper	*Calidris pusilla*	9	III
Fish	Golden Redhorse	*Moxostoma erythrurum*	9	III
Fish	Slender Madtom	*Noturus exilis*	9	III
Birds	Snowy Egret	*Egretta thula*	9	III
Fish	Spotted Gar	*Lespisosteus oculatus*	9	III
Amphibians	Pickerel Frog	*Rana palustris*	9	III
Fish	Shorthead Redhorse	*Moxostoma macrolepidotum*	9	III
Birds	White-rumped Sandpiper	*Calidris fuscicollis*	9	III
Birds	Louisiana Waterthrush	*Seiurus motacilla*	9	III
Turtles	Smooth Softshell	*Apalone mutica*	9	III
Fish	Freckled Madtom	*Noturus nocturnus*	9	III
Amphibians	Common Mudpuppy	*Necturus maculosus*	9	III
Mussels	Giant Floater	*Pyganodon grandis*	8	III
Fish	Stonecat	*Noturus flavus*	8	III
Fish	Warmouth	*Lepomis gulosus*	8	III
Fish	Orangethroat Darter	*Etheostoma spectabile*	8	III
Fish	Logperch	*Percina caprodes*	8	III
Fish	Slenderhead Darter	*Percina phoxocephala*	8	III
Crustaceans	Virile Crayfish	*Orconectes virilis*	8	III
Mussels	Mapleleaf	*Quadrula quadrula*	8	III
Mussels	Fragile Papershell	*Leptodea fragilis*	7	III
Fish	Paddlefish	*Polyodon spathula*	7	III
Mussels	Pink Papershell	*Potamilus ohiensis*	7	III

(T) means State Threatened (Federal threatened are included)
(E) means State Endangered (Federal endangered are included)
(X) means extirpated

Issues and Strategies: for the Aquatic-Eastern Streams/Small Rivers Habitat

The issues, with their accompanying strategies, are listed in general priority order.

Issues:

Water Quality

- Water quality is being altered by chemical runoff of pesticides, herbicides and fertilizers.
- Urbanization is causing accelerated runoff that is not filtered through natural buffers.
- Land management practices within the watershed are negatively impacting water quality.
- The change in the hydrology of the small rivers and streams has negative impacts on the flora and fauna of the waterways and the riparian corridors.

Strategies:

- Implement an information/education program for landowners and managers on the use of best management practices.
- Educate public officials at all levels and their staffs.
- Encourage appreciation of public streams and rivers and educate owners of their importance.
- Conduct research to understand response of biota to water quality.
- Implement regulated and standardized stream-monitoring programs.
- Conduct research to better understand the impact of road construction and maintenance on small river habitat, and develop best management practices.
- Conduct research to better understand the effect of snow removal/salt on small river habitat, and develop best management practices.
- Study the impact of removing farm ponds and reservoirs.
- Evaluate the impact of agricultural chemicals on water quality, and develop best management practices for the use of agricultural chemicals.
- Evaluate the impact of lawn/garden products on water quality, and develop best management practices for these products.
- Investigate contaminant effects on reptilian and amphibian populations
- Monitor impacts to fisheries from feedlots, urban areas, and factories.
- Identify pollution problem areas and improve conditions detrimental to biodiversity and endangered species.
- Provide economic incentives to those who use best management practices.
- Expand WRAP, Wetland and Riparian Areas Program of the Kansas Dept. of Health and Environment.
- Improve water quality standards.
- Promote improved water quality standards and efforts to maintain minimum desirable stream flows.
- Work with local, state and federal agencies to reduce impacts to habitat resulting from their programs.
- Promote ecologically sound techniques for flood control, erosion control, non-point source pollution control, and bank stabilization, which will provide high aquatic

habitat diversity, and determine engineering techniques for preventing monotypic habitats.
- Encourage conservation of riparian habitat/ corridor easements – pay landowners.
- Promote grazing incentives that limit livestock access to streams.
- Promote sound water quality standards and their enforcement through education and continued coordination with the Kansas Department of Health and Environment; and, related to stream ratings, dependent on the presence of rare fishes, unique assemblages, or high biodiversity.
- Administer minimum stream flows.

Issues:

Habitat Loss of Streams

- ▶ Land management practices and fragmentation within watersheds are altering stream habitats.
- ▶ The fragmentation of streams by impoundments and low head dams is harmful to stream habitats.
- ▶ Dredging, channelization and other physical changes to streams and small rivers destroy habitat.

Strategies:

- Encourage appreciation of public streams and rivers; educate landowners of the importance of streams and rivers.
- Expand statewide, standardized surveys to update stream assessments and monitor Kansas fish populations and their habitats, and incorporate GIS.
- In relation to terrestrial wildlife, determine population status, crucial habitats and limiting factors of all riverine biota, with emphasis on the Marais de Cygnes, Neosho, Spring, Verdigris and Walnut River Basins.
- Monitor impacts to fisheries from pollution sources.
- Identify pollution problem areas and improve conditions detrimental to biodiversity and endangered species.
- Coordinate with Kansas Dept. of Transportation concerning bridge construction and maintenance.
- Work with landowners and managers to establish best management practices for adjacent lands.
- Assess water releases from reservoirs to reduce impacts on the stream habitat.
- Improve state management of sand and gravel harvest.
- Work with local, state and federal agencies to reduce negative impacts to habitat resulting from their programs.
- Promote ecologically sound techniques for flood control, erosion control, non-point source pollution control, and bank stabilization, which will provide high aquatic habitat diversity, and determine engineering techniques for preventing monotypic habitats.
- Develop programs to establish buffers and restore riparian corridors.
- Encourage conservation of the riparian habitat/ corridor.
- Use conservation easements – pay landowners.
- Implement grazing strategies that limit livestock access to streams.
- Promote sound water quality standards and their enforcement through education and continued coordination with the Kansas Department of Health and Environment; and,

relate the standards to stream ratings, dependent on the presence of rare fishes, unique assemblages, or high biodiversity.
- Administer minimum stream flows.
- Assess the feasibility of removing dams and impoundments.
- Continue to standardize population and quantitative aquatic habitat evaluation procedures and publish in technical handbook.

Issues:

Hydrology (quantity):

- ▶ The changes in the hydrology of small rivers and streams are having negative impacts on the flora and fauna of the riparian corridor.
- ▶ Fragmentation within watersheds is affecting runoff and altering the stream hydrology.
- ▶ Urbanization is causing accelerated runoff that alters stream hydrology.
- ▶ The lack of functional vegetation in the riparian corridor, and channelization, has changed small river hydrology.

Strategies:

- Encourage appreciation of public streams and rivers; educate landowners of the importance of streams and rivers.
- Conduct basic research on the hydrology of small rivers and streams to clarify their dynamics.
- Develop more sound water use allocation rules.
- Implement additional minimum desirable stream flows in some instances.
- Identify best management practices for good watershed management.
- Implement best management practices with landowners.
- Manage the water release from reservoirs to reduce impacts on the stream habitat.
- Work with local, state and federal agencies to reduce impacts to habitat resulting from their programs.
- Promote ecologically sound techniques for flood control, erosion control, non-point source pollution control, and bank stabilization, which will provide high aquatic habitat diversity, and determine engineering techniques for preventing monotypic habitats.
- Develop programs to establish buffers and restore the riparian corridor.
- Encourage better management of the riparian habitat/ corridor.
- Use conservation easements – pay landowners.

Issue:

- ▶ There is a lack of data on species present, and habitat needs.

Strategies:

- Conduct wildlife surveys.
- Conduct studies of habitat needs of species that inhabit the area.
- Conduct studies on habitat quality and quantity.

Issues:

Aquatic Species Management

- ▶ Over fishing is having a negative impact on fisheries in small rivers and streams
- ▶ Invasive species are impacting the native flora and fauna of small rivers and streams.

- ▶ What occurs in the watersheds of small rivers and stream in other states impacts downstream watersheds in Kansas.

Strategies:

- Educate landowners of positive values of rare species.
- Educate the public on the importance of keeping invasive species out of small rivers and streams.
- Determine the effects that fish from impoundments have on upstream and downstream fish populations.
- Conduct research to develop better long term monitoring techniques.
- Develop and implement a State Task Force for Aquatic Nuisance Species.
- Conduct baseline habitat and population surveys.
- Provide economic incentives for landowners to manage/eradicate invasive species.
- Pursue funding for Aquatic Nuisance Species management.
- Identify best management practices.
- Work with landowners to implement best management practices.
- Develop a "clean" list of species allowed in Kansas to complement the Lacy Act.
- The Kansas Dept. of Wildlife and Parks needs to develop a Sensitive Species Conservation Plan program.
- Expand cooperative programs that supply technical and direct assistance for invasive species control problems and efforts.
- Develop plans to prevent the invasion of exotic fish, such as round gobies, *Neogobius melanostomus*, European ruffe, *Gymnocephalus cernuus*, and black carp, *Mylopharyngodon piceus*
- Assess regulation of the aquaculture industry and other related industries (e.g., commercial fishermen, pet industry) in Kansas.
- Enforce illegal stocking regulations.
- Kansas Dept. of Wildlife and Parks needs to work with other states and federal agencies to assure that no invasive species are being transported in Kansas.

Monitoring of Aquatic-Eastern Streams/Small Rivers Habitat

- ♦ Use identifier species (indicator species) to monitor the health of this habitat.
- ♦ Develop baseline data for habitat quality and quantity.
- ♦ Implement a long term monitoring program of the baseline data.
- ♦ Institute a public and private landowner survey of current management practices and repeated periodically.
- ♦ Collect demographic data and monitor public attitude toward this habitat.
- ♦ Monitor species vulnerable to land fragmentation and track future population movements and changes.
- ♦ Generate a map that tracks land conserved through easements.
- ♦ Monitor attitudes of private landowners who are managing this habitat.
- ♦ Monitor landowners' best management practice's implementation.
- ♦ Monitor water chemistry and biota.
- ♦ Use creel surveys to monitor population trends.
- ♦ Track fish kills and monitor trends.
- ♦ Monitor Kansas Dept. of Health and Environment and Kansas Biological Survey's Bio-Survey data and coordinate their databases.
- ♦ Inventory and quantify stream populations of vertebrates and invertebrates.
- ♦ Monitor small river and stream dynamics.

Deciduous Forests and Deciduous Floodplain Habitats

The Deciduous Forest habitat is made up of the Maple – Basswood Forest, Oak, Hickory Forest, Deciduous Forest-Mined Land, Mixed Oak Ravine, Oak Savanna and Deciduous Woodland habitats. The quality and quantity trends for this habitat are both unknown. Some of the dominant species are:

Acer saccharum - Sugar Maple
Tilia americana - American Basswood
Quercus alba - White Oak
Quercus muehlenbergii - Chinkapin Oak
Populus deltoids - Eastern Cottonwood
Salix nigra - Black Willow
Ulmus rubra - Slippery Elm
Maclura pomifera - Osage Orange
Gleditsia triacanthos - Honeylocust

The Deciduous Floodplain habitat is comprised of Pecan Floodplain Forest, Mixed Oak Floodplain Forest, Ash-Elm-Hackberry Floodplain Forest, Cottonwood Floodplain Forest, Maple Floodplain Forest, and the Cottonwood Floodplain Woodlands. The quality and quantity trends for this habitat are both unknown. The Deciduous Floodplains are temporarily flooded habitats. Some of the dominant species are:

Carya illinoinensis - Pecan
Quercus macrocarpa - Bur Oak
Fraxinus pennsylvanica - Green Ash
Ulmus americana - American Elm
Populus deltoides - Eastern Cottonwood
Acer saccharum - Sugar Maple
Betula nigra - River Birch
Celtis occidentalis - Hackberry

The Species of Greatest Conservation Need for the Deciduous Forests habitat are listed in table 13. They are ranked into tiers. This process is shown in detail in Appendix 1 "Kansas' Species of Greatest Conservation Need – Selection and Ranking". This ranking established a baseline against which future evaluations and monitoring can be compared, on a species basis. It will also be used to prioritize research and survey proposals.

Table 13. Eastern Tallgrass Prairie Conservation Region
Deciduous Forest Habitat
Species of Greatest Conservation Need

Group	Common Name/	Scientific Name	Total	Tier
Birds	Rusty Blackbird	*Euphagus carolinus*	13	I
Insect	Ozark Emerald	*Somatochlora ozarkensis*	13	I
Insect	American Burying Beetle (E)	*Nicrophorus americanus*	13	I
Birds	Cerulean Warbler	*Dendroica cerulea*	13	I

Table 13. Eastern Tallgrass Prairie Conservation Region
Deciduous Forest Habitat
Species of Greatest Conservation Need

Group	Common Name/	Scientific Name	Total	Tier
Mammals	Spotted Skunk (T)	*Spilogale putorius*	12	I
Birds	Lewis's Woodpecker	*Melanerpes lewis*	12	I
Reptiles	Timber Rattlesnake	*Crotalus horridus*	12	I
Insect	Gray Petaltail	*Tachopteryx thoreyi*	12	I
Insect	Linda's Roadside Skipper	*Amblyscirtes linda*	12	I
Mammals	Little Brown Myotis	*Myotis lucifugus*	11	I
Mammals	Gray Myotis (E)	*Myotis grisescens*	11	I
Birds	Black Tern	*Chlidonias niger*	11	I
Birds	Whip-poor-will	*Caprimulgus vociferus*	11	I
Birds	Yellow-throated Warbler	*Dendroica dominica*	11	I
Birds	Kentucky Warbler	*Oporornis formosus*	11	I
Birds	Painted Bunting	*Passerina ciris*	11	I
Mammals	Southern Flying Squirrel	*Glaucomys volans*	11	I
Reptiles	Redbelly Snake (T)	*Storeria occipitomaculata*	11	I
Reptiles	Smooth Earth Snake (T)	*Virginia valeriae*	10	II
Insect	Bell's Roadside Skipper	*Amblyscirtes belli*	10	II
Amphibians	Green Frog (T)	*Rana clamitans*	10	II
Amphibians	Northern Cricket Frog	*Acris crepitans*	10	II
Amphibians	Oklahoma Salamander (E)	*Eurycea tyenrehsis*	10	II
Amphibians	Cave Salamander (E)	*Eurycea lucifuga*	10	II
Amphibians	Longtail Salamander (T)	*Eurycea longicauda*	10	II
Mammals	Texas Mouse	*Peromyscus attwateri*	10	II
Mammals	Fulvous Harvest Mouse	*Reithrodontomys fulvescens*	10	II
Mammals	American Black Bear (X)	*Ursus americanus*	10	II
Amphibians	Eastern Newt (T)	*Notophtalmus viridescens*	10	II
Birds	Brown Thrasher	*Toxostoma rufum*	10	II
Birds	Chuck-will's-widow	*Caprimulgus carolinensis*	10	II
Reptiles	Broadhead Skink (T)	*Eumeces laticeps*	10	II
Amphibians	Eastern Narrowmouth Toad (T)	*Gastrophryne carolinensis*	10	II
Reptiles	Coal Skink	*Eumeces anthracinus*	10	II
Reptiles	Rough Earth Snake	*Virginia striatula*	10	II
Birds	Eastern Wood-Pewee	*Contopus virens*	10	II
Birds	Orchard Oriole	*Icterus spurius*	10	II
Birds	Baltimore Oriole	*Icterus galbula*	10	II
Birds	Pileated Woodpecker	*Dryocopus pileatus*	10	II
Reptiles	Eastern Hognose Snake	*Heterodon platirhinos*	10	II
Reptiles	Cottonmouth	*Agkistrodon piscivorus*	10	II
Amphibians	Pickerel Frog	*Rana palustris*	9	III
Amphibians	Spring Peeper (T)	*Pseudacris crucifer*	9	III
Birds	Harris' Sparrow	*Zonotrichia querula*	9	III
Insect	Monarch	*Danaus plexippus*	9	III
Birds	Mississippi Kite	*Ictinia mississippiensis*	9	III
Birds	Northern Bobwhite	*Colinus virginianus*	9	III
Birds	Red-headed Woodpecker	*Melanerpes erythrocephalus*	9	III
Reptiles	Milk Snake	*Lampropeltis triangulum*	8	III
Mammals	Common Gray Fox	*Urocyon cinereoargenteus*	8	III

Table 13. Eastern Tallgrass Prairie Conservation Region Deciduous Forest Habitat Species of Greatest Conservation Need				
Group	**Common Name/**	**Scientific Name**	**Total**	**Tier**
Reptiles	Rough Green Snake	*Opheodrys aestivus*	8	III

(T) means State Threatened (Federal threatened are included)
(E) means State Endangered (Federal endangered are included)
(X) means extirpated

The Species of Greatest Conservation Need for the Deciduous Floodplain habitat are listed in table 14. They are ranked into tiers. This process is shown in detail in Appendix 1 "Kansas' Species of Greatest Conservation Need – Selection and Ranking". This ranking established a baseline against which future evaluations and monitoring can be compared, on a species basis. It will also be used to prioritize research and survey proposals.

Table 14. Eastern Tallgrass Prairie Conservation Region Deciduous Floodplain Habitat Species of Greatest Conservation Need				
Group	**Common Name**	**Scientific Name**	**Total**	**Tier**
Birds	Cerulean Warbler	*Dendroica cerulea*	13	I
Birds	Rusty Blackbird	*Euphagus carolinus*	13	I
Birds	Loggerhead Shrike	*Lanius ludovicianus*	13	I
Birds	Marbled Godwit	*Limosa fedoa*	12	I
Insect	Linda's Roadside Skipper	*Amblyscirtes linda*	12	I
Amphibians	Crawfish Frog	*Rana areolata*	12	I
Insect	Gray Petaltail	*Tachopteryx thoreyi*	12	I
Mammals	Spotted Skunk (T)	*Spilogale putorius*	12	I
Reptiles	Timber Rattlesnake	*Crotalus horridus*	12	I
Birds	Greater Prairie-Chicken	*Tympanuchus cupido*	12	I
Reptiles	Redbelly Snake (T)	*Storeria occipitomaculata*	11	I
Birds	Little Blue Heron	*Egretta caerulea*	11	I
Birds	Bell's Vireo	*Vireo bellii*	11	I
Birds	Painted Bunting	*Passerina ciris*	11	I
Birds	Barn Owl	*Tyto alba*	11	I
Birds	Brewer's Blackbird	*Euphagus cyanocephalus*	11	I
Birds	Whip-poor-will	*Caprimulgus vociferus*	11	I
Birds	Prothonotary Warbler	*Protonotaria citrea*	11	I
Birds	Black-crowned Night-Heron	*Nycticorax nycticorax*	11	I
Birds	Kentucky Warbler	*Oporornis formosus*	11	I
Mammals	Southern Bog Lemming	*Synaptomys cooperi*	11	I
Birds	Yellow-throated Warbler	*Dendroica dominica*	11	I
Mammals	Franklin's Ground Squirrel	*Spermophilus franklinii*	11	I
Mammals	Southern Flying Squirrel	*Glaucomys volans*	11	I
Mammals	Little Brown Myotis	*Myotis lucifugus*	11	I
Amphibians	Grotto Salamander (E)	*Typhlotriton spelaeus*	11	I
Mammals	Gray Myotis (E)	*Myotis grisescens*	11	I
Birds	Pileated Woodpecker	*Dryocopus pileatus*	10	II
Birds	Chuck-will's-widow	*Caprimulgus carolinensis*	10	II
Birds	Eastern Wood-Pewee	*Contopus virens*	10	II
Birds	Greater Yellowlegs	*Tringa melanoleuca*	10	II

Table 14. Eastern Tallgrass Prairie Conservation Region
Deciduous Floodplain Habitat
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Birds	Lesser Yellowlegs	*Tringa flavipes*	10	II
Birds	Upland Sandpiper	*Bartramia longicauda*	10	II
Birds	Northern Pintail	*Anas acuta*	10	II
Birds	American Bittern	*Botaurus lentiginosus*	10	II
Birds	Great Egret	*Ardea alba*	10	II
Mammals	American Black Bear (X)	*Ursus americanus*	10	II
Mammals	Fulvous Harvest Mouse	*Reithrodontomys fulvescens*	10	II
Insect	Bell's Roadside Skipper	*Amblyscirtes belli*	10	II
Birds	Bald Eagle (T)	*Haliaeetus leucocephalus*	10	II
Reptiles	Western Hognose Snake	*Heterodon nasicus*	10	II
Amphibians	Northern Cricket Frog	*Acris crepitans*	10	II
Amphibians	Oklahoma Salamander (E)	*Eurycea tyenrehsis*	10	II
Amphibians	Cave Salamander (E)	*Eurycea lucifuga*	10	II
Amphibians	Longtail Salamander (T)	*Eurycea longicauda*	10	II
Amphibians	Eastern Newt (T)	*Notophtalmus viridescens*	10	II
Amphibians	Green Frog (T)	*Rana clamitans*	10	II
Reptiles	Massasauga	*Sistrurus catenatus*	10	II
Reptiles	Cottonmouth	*Agkistrodon piscivorus*	10	II
Reptiles	Smooth Earth Snake (T)	*Virginia valeriae*	10	II
Reptiles	Rough Earth Snake	*Virginia striatula*	10	II
Birds	Brown Thrasher	*Toxostoma rufum*	10	II
Reptiles	Eastern Hognose Snake	*Heterodon platirhinos*	10	II
Reptiles	Broadhead Skink (T)	*Eumeces laticeps*	10	II
Birds	Dickcissel	*Spiza americana*	10	II
Reptiles	Coal Skink	*Eumeces anthracinus*	10	II
Amphibians	Eastern Narrowmouth Toad (T)	*Gastrophryne carolinensis*	10	II
Reptiles	Texas Horned Lizard	*Phrynosoma cornutum*	10	II
Birds	Orchard Oriole	*Icterus spurius*	10	II
Birds	Baltimore Oriole	*Icterus galbula*	10	II
Insect	Monarch	*Danaus plexippus*	9	III
Amphibians	Spring Peeper (T)	*Pseudacris crucifer*	9	III
Birds	Eastern Kingbird	*Tyrannus tyrannus*	9	III
Birds	Louisiana Waterthrush	*Seiurus motacilla*	9	III
Birds	Red-headed Woodpecker	*Melanerpes erythrocephalus*	9	III
Amphibians	Eastern Tiger Salamander	*Ambystoma tigrinum*	9	III
Birds	Mississippi Kite	*Ictinia mississippiensis*	9	III
Birds	Harris' Sparrow	*Zonotrichia querula*	9	III
Birds	Northern Bobwhite	*Colinus virginianus*	9	III
Turtles	Smooth Softshell	*Apalone mutica*	9	III
Amphibians	Pickerel Frog	*Rana palustris*	9	III
Crustaceans	A Crayfish	*Orconectes nais*	9	III
Birds	Snowy Egret	*Egretta thula*	9	III
Birds	American Tree Sparrow	*Spizella arborea*	9	III
Crustaceans	Virile Crayfish	*Orconectes virilis*	8	III
Mammals	Swamp Rabbit (X)	*Sylvilagus aquaticus*	8	III
Mammals	Common Gray Fox	*Urocyon cinereoargenteus*	8	III

Table 14. Eastern Tallgrass Prairie Conservation Region Deciduous Floodplain Habitat Species of Greatest Conservation Need				
Group	**Common Name**	**Scientific Name**	**Total**	**Tier**
Reptiles	Milk Snake	*Lampropeltis triangulum*	8	III
Reptiles	Rough Green Snake	*Opheodrys aestivus*	8	III

(T) means State Threatened (Federal threatened are included)
(E) means State Endangered (Federal endangered are included)
(X) means extirpated

Issues and Strategies: for the Deciduous Forests and Deciduous Floodplain Habitats

The issues, with their accompanying strategies, are listed in general priority order.

Issues:

Management of Deciduous Forests and Deciduous Floodplain Habitats

- Some grazing practices in Deciduous Forests and Deciduous Floodplain Habitats are damaging these habitats.
- Lack of management or poor management of some of these habitats, and their watersheds, are having long-term negative impacts on these habitats.
- The management of floodplain water levels by diking is having long-term negative impacts on these habitats.
- Lack of proper timber harvest and a market for low quality species is having long-term negative impacts on these habitats.
- The spread of weedy-woodys and other invasive species are having long-term negative impacts on these habitats.
- Off target herbicide damage is having negative impacts on these habitats.
- The lack of fire management is changing species dominance in this habitat.
- The predominance of shade tolerant species is altering species dominance.
- Lack of knowledge and understanding of deciduous forests and deciduous floodplains leads to poor management decisions.

Strategies:

- Educate public officials at all levels and their staffs.
- Conduct education to promote better understanding of existing management practices.
- Conduct forest product research.
- Conduct forestry workshops for landowners/managers and the forest industry.
- Implement monitoring programs for insect and disease pests that are moving into the area.
- Provide technical assistance and financial incentives for landowners to implement best management practices.
- Promote proper thinning of forest and woodlands.
- Implement programs to control invasive species.
- Assess dike removal for returning floodplains to proper hydrology.
- Conduct research to better understand the habitat needs of the species of greatest conservation need.
- Promote the construction of proper logging trails.
- Identify and conserve large forests tracts through landowner friendly methods.
- Identify opportunities to connect large forest tracts.
- Promote the use of best management practices in forests and adjacent lands.

Issues:

Conservation of Deciduous Forests and Deciduous Floodplain Habitats.

- ▶ Urbanization and agricultural activities are changing these habitats.
- ▶ Some grazing practices in Deciduous Forests and Deciduous Floodplain Habitats are damaging these habitats.
- ▶ The management of floodplains water levels by diking is having long-term negative impacts on these habitats.
- ▶ Areas of cottonwoods have decreased.
- ▶ Overgrowth of woody invasive species is harming native species.
- ▶ The use of fire is damaging these habitats.
- ▶ Invasive insect pests are damaging these habitats.
- ▶ Lack of knowledge and understanding of deciduous forests and deciduous floodplains leads to poor management decisions.

Strategies:

- Educate landowners, natural resource managers and the industry about the proper management of deciduous forests and deciduous floodplains.
- Educate landowners, managers and natural resource mangers in the proper use of herbicides, pesticides and fire.
- Conduct research on livestock and timber harvest best management practices.
- Acquire conservation easements through landowner friendly methods.
- Promote the Forest Legacy Program.
- Support legislative actions to ensure tax incentives and/or conservation of these habitats.
- Implement stream bank stabilization projects.
- Promote and encourage landowners, managers and local officials in the watershed to use best management practices.

Issue:

- ▶ There is a lack of data on species present, and habitat needs.

Strategies:

- Conduct wildlife surveys.
- Conduct studies of habitat needs of species that inhabit the area.
- Conduct studies on habitat quality and quantity.

Monitoring of Deciduous Forests and Deciduous Floodplain Habitats

- ♦ Use Kansas Forest Inventory and Analysis Program (FIA) as a tool for monitoring.
- ♦ Use U.S. Dept. of Agriculture data to monitor chemicals, disease, and insects.
- ♦ Use identifier species (indicator species) to monitor the health of this habitat.
- ♦ Develop baseline data for habitat quality and quantity.
- ♦ Implement a long term monitoring program of the baseline data.
- ♦ Institute a public and private landowner survey of current management practices and repeat periodically.
- ♦ Collect demographic data and monitor public attitude towards Deciduous Forests and Deciduous Floodplain Habitats.
- ♦ Monitor species vulnerable to fragmentation and track future changes.
- ♦ Generate a map that tracks conserved land areas through easements.

- ♦ Monitor attitudes of private landowners who are managing deciduous forests and floodplains.
- ♦ Monitor best management practice implementation.

Aquatic Eastern Large Rivers Habitat

Aquatic Eastern Large Rivers Habitat are those portions of the Missouri, Arkansas and the Kansas Rivers that either border or flow through the Eastern Tallgrass Prairie Conservation Region. The quality and quantity trends for this habitat are both declining.

The Species of Greatest Conservation Need for the Aquatic Eastern Large Rivers Habitat are listed on Table 15. They are ranked into tiers. This process is shown in detail in Appendix 1 "Kansas' Species of Greatest Conservation Need – Selection and Ranking". This ranking established a baseline against which future evaluations and monitoring can be compared, on a species basis. It will also be used to prioritize research and survey proposals.

Table 15. Eastern Tallgrass Prairie Conservation Region
Aquatic-Eastern Large Rivers
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Mussels	Neosho Mucket (E)	*Lampsilis rafinesqueana*	16	I
Fish	Sturgeon Chub (T)	*Macrhybopsis gelida*	14	I
Mussels	Western Fanshell (E)	*Cyprogenia aberti*	14	I
Mussels	Elktoe (E)	*Alasmidonta marginata*	13	I
Mussels	Butterfly (T)	*Ellipsaria lineolata*	13	I
Fish	Arkansas River Shiner (X) (E)	*Notropis girardi*	13	I
Fish	Pallid Sturgeon (E)	*Scaphirhynchus albus*	13	I
Mussels	Round Pigtoe Mussel	*Pleurobema sintoxia*	13	I
Fish	Plains Minnow	*Hybognathus placitus*	13	I
Mussels	Rabbitsfoot (E)	*Quadrula cylindrica*	13	I
Fish	Western Silvery Minnow (T)	*Hybognathus argyritis*	13	I
Fish	Sicklefin Chub (E)	*Macrhybopsis meeki*	13	I
Fish	Flathead Chub (T)	*Platygobio gracilis*	12	I
Fish	Silverband Shiner (T)	*Notropis shumardi*	12	I
Fish	Chestnut Lamprey (T)	*Ichthyomyzon castaneus*	12	I
Birds	Piping Plover (T)	*Charadrius melodius*	12	I
Fish	Brassy Minnow	*Hybognathus hankinsoni*	12	I
Birds	Stilt Sandpiper	*Calidris himantopus*	12	I
Turtles	Alligator Snapping Turtle	*Macrochelys temminckii*	12	I
Mussels	Deertoe	*Truncilla truncata*	12	I
Mussels	Wartyback	*Quadrula nodulata*	12	I
Mussels	Ouachita Kidneyshell (T)	*Ptychobranchus occidentalis*	12	I
Mussels	Fluted-Shell (T)	*Lasmigona costata*	12	I
Fish	Highfin Carpsucker	*Carpiodes velifer*	12	I
Mussels	Spike	*Elliptio dilatata*	12	I
Birds	Least Tern (E)	*Sterna antillarum*	12	I
Fish	Common Shiner	*Luxilus cornutus*	11	I
Fish	Shoal Chub	*Macrhybopsis hyostoma*	11	I

Table 15. Eastern Tallgrass Prairie Conservation Region
Aquatic-Eastern Large Rivers
Species of Greatest Conservation Need

Group	Common Name	Scientific Name	Total	Tier
Fish	Quillback	*Carpiodes cyprinus*	11	I
Mussels	Rock-Pocketbook (T)	*Arcidens confragosus*	11	I
Mussels	Snuffbox (X)	*Epioblasma triquetra*	11	I
Fish	River Shiner	*Notropis blennius*	11	I
Fish	Silver Chub (E)	*Macrhybopsis storeriana*	11	I
Mussels	Yellow Sandshell	*Lampsilis teres*	11	I
Gastropods	Sharp Hornsnail (T)	*Pleurocera acuta*	11	I
Fish	American Eel	*Anguilla rostrata*	11	I
Fish	Blue Sucker	*Cycleptus elongatus*	11	I
Mussels	Fatmucket	*Lampsilis siliquoidea*	11	I
Birds	Little Blue Heron	*Egretta caerulea*	11	I
Mussels	Black Sandshell (X)	*Ligumia recta*	11	I
Birds	Black Tern	*Chlidonias niger*	11	I
Birds	Forster's Tern	*Sterna forsteri*	11	I
Mussels	Mucket (E)	*Actinonaias ligamenta*	11	I
Birds	Black-crowned Night-Heron	*Nycticorax nycticorax*	11	I
Amphibians	Northern Cricket Frog	*Acris crepitans*	10	II
Fish	White Sucker	*Catostomus commersonii*	10	II
Mussels	Fawnsfoot	*Truncilla donaciformis*	10	II
Fish	Shovelnose Sturgeon	*Scaphirhynchus platorynchus*	10	II
Mussels	Purple Wartyback	*Cyclonaias tuberculata*	10	II
Mussels	Bleufer	*Potamilus purpuratus*	10	II
Mussels	Washboard	*Megalonaias nervosa*	10	II
Mussels	Plain Pocketbook	*Lampsilis cardium*	10	II
Mussels	Wabash Pigtoe	*Fusconaia flava*	10	II
Mussels	Pink Heelsplitter	*Potamilus alatus*	10	II
Mussels	Pistolgrip	*Tritogonia verrucosa*	10	II
Mussels	Monkeyface	*Quadrula metanevra*	10	II
Crustaceans	A Crayfish	*Orconectes luteus*	10	II
Fish	Black Buffalo	*Ictiobus niger*	10	II
Birds	Least Sandpiper	*Calidris minutilla*	10	II
Birds	Baird's Sandpiper	*Calidris bairdii*	10	II
Birds	Bald Eagle (T)	*Haliaeetus leucocephalus*	10	II
Birds	Northern Pintail	*Anas acuta*	10	II
Birds	Great Egret	*Ardea alba*	10	II
Fish	Shorthead Redhorse	*Moxostoma macrolepidotum*	9	III
Mussels	Creeper	*Strophitus undulatus*	9	III
Mussels	Threehorn Wartyback	*Obliquaria reflexa*	9	III
Mussels	Pondmussel	*Ligumia subrostrata*	9	III
Turtles	Smooth Softshell	*Apalone mutica*	9	III
Mussels	White Heelsplitter	*Lasmigona complanata*	9	III
Birds	American White Pelican	*Pelecanus erythrorhynchos*	9	III
Mussels	Threeridge	*Amblema plicata*	9	III
Birds	Snowy Egret	*Egretta thula*	9	III
Birds	White-rumped Sandpiper	*Calidris fuscicollis*	9	III
Fish	Golden Redhorse	*Moxostoma erythrurum*	9	III

Table 15. Eastern Tallgrass Prairie Conservation Region Aquatic-Eastern Large Rivers Species of Greatest Conservation Need				
Group	**Common Name**	**Scientific Name**	**Total**	**Tier**
Fish	Spotted Gar	*Lespisosteus oculatus*	9	III
Fish	Orangethroat Darter	*Etheostoma spectabile*	8	III
Mussels	Mapleleaf	*Quadrula quadrula*	8	III
Fish	Stonecat	*Noturus flavus*	8	III
Mussels	Giant Floater	*Pyganodon grandis*	8	III
Crustaceans	Virile Crayfish	*Orconectes virilis*	8	III
Fish	Logperch	*Percina caprodes*	8	III
Fish	Paddlefish	*Polyodon spathula*	7	III
Mussels	Fragile Papershell	*Leptodea fragilis*	7	III
Mussels	Pink Papershell	*Potamilus ohiensis*	7	III

(T) means State Threatened (Federal threatened are included)
(E) means State Endangered (Federal endangered are included)
(X) means extirpated

Issues and Strategies: for the Aquatic Eastern Large Rivers Habitat

The issues, with their accompanying strategies, are listed in general priority order.

Issues:

Water Quality

- The management strategies of other states in the watershed impact this habitat.
- Water quality is being altered by runoff of pesticides, herbicides and fertilizers.
- Industrial and municipal discharges affect water quality.
- Urbanization is causing accelerated runoff that is not filtered through natural buffers.
- Land management practices within the watershed are altering the water quality.
- The management strategies on federal reservoirs impact this habitat.

Strategies:

- Educate public officials at all levels and their staffs.
- Educate multiple audiences on the negatives impacts of lowering water quality.
- Implement an information/education program for landowners and managers about best management practices.
- Work with local, state and federal agencies to reduce impacts to habitat resulting from their programs.
- Encourage appreciation of public streams and rivers; educate landowners of the importance of streams and rivers.
- Promote ecologically sound techniques for flood control, erosion control, non-point source pollution control, and bank stabilization, which will provide high aquatic habitat diversity, and determine engineering techniques for preventing monotypic habitats.
- Conduct research to understand response of wildlife to water quality.
- Conduct research to better understand the impacts of road construction and maintenance, and develop best management practices.
- Conduct research to better understand the effect of snow removal/salt, and develop best management practices.
- Determine the impact of removing impoundments.

- Evaluate the impact of agricultural chemicals on water quality and develop best management practices.
- Evaluate the impact of lawn/garden products on water quality and develop best management practices.
- Investigate contaminant effects on reptilian and amphibian populations.
- Monitor impacts to fisheries from pollution sources.
- Identify pollution problem areas and improve conditions detrimental to biodiversity and endangered species.
- Assess impacts of dike removal on floodplains.
- Strengthen and enforce water quality standards.
- Take steps to reduce the nutrient/chemical discharge from point and non-point sources.
- Provide economic incentives to those who use best management practices.
- Expand WRAP, Wetland and Riparian Areas Program - Kansas Dept. of Health and Environment.
- Regulate and standardize stream monitoring programs.
- Set water quality minimum standards.
- Promote improved water quality standards and efforts to maintain minimum desirable stream flows.
- Encourage better riparian habitat/corridor management.
- Pay landowners for easements.
- Promote grazing incentives that limit livestock access to streams.
- Promote sound water quality standards and their enforcement through education and continued coordination with the Kansas Department of Health and Environment, and their linkage to stream ratings, dependent on the presence of rare fishes, unique assemblages, or high biodiversity.
- Administer minimum stream flows.

Issues:

Hydrology

- The management strategies of other states in the watershed impact this habitat.
- Industrial and municipal discharges affect large river hydrology.
- Urbanization is causing accelerated runoff.
- Commercial shipping practices impact the hydrology of these rivers.
- Land management practices within the watershed are altering water quality.
- The management strategies on federal reservoirs impact this habitat.

Strategies:

- Educate the public and public officials at all levels and their staffs about river hydrology.
- Educate the public and officials on the value of and the interconnection between uplands and river hydrology.
- Implement incentives to restore floodplains and meanders of these rivers.
- Alter flow regulation to enhance flora and fauna of this habitat.
- Install urban/rural catch basins to reduce accelerated runoff.
- Work with the Natural Resources Conservation Service and others to establish flow models for these rivers, to assist in flow regulation.

Issues:

Habitat Loss

- The management strategies of other states in the watershed impact this habitat.
- Industrial and municipal discharges affect this habitat.
- Urbanization is causing accelerated runoff that is not filtered through natural buffers.
- Land management practices within the watershed are altering water quality.
- The management strategies on federal reservoirs impact this habitat.

Strategies:

- Coordinate water releases from federal reservoirs with the Army Corps of Engineers.
- Implement incentives to restore floodplains and meanders of these rivers.
- Improve the coordination of mitigation activities with the Army Corps of Engineers.
- Implement incentives to restore connectivity with flood plains.
- Enforce municipal discharge regulations.
- Actively seek conservation easements.
- Develop and implement incentives to restore and conserve riparian habitat.

Issues:

Aquatic Species Management

- Commercial barge shipping practices impact the flora and fauna of these rivers.
- The management strategies of other states in the watershed impact this habitat.
- Industrial and municipal discharges impact the flora and fauna of these rivers.
- Commercial fishing operations impact the flora and fauna of these rivers.
- Land management practices within the watershed are altering water quality.
- The management strategies on federal reservoirs impact this habitat.

Strategies:

- Educate the public and users about species of greatest conservation need and their value.
- Research the impact of the Bowersock Dam on species moving up and down river.
- Seek better management of commercial fishing.
- Implement programs to control invasive species.
- Seek better management of discharge from commercial ships.
- Establish a “clean list” of approved species in conjunction with other states.
- Coordinate the flow management of these rivers with the Army Corps of Engineers.
- Implement projects to restore floodplains, meanders and backwaters as nursery areas for these rivers.
- Improve the coordination of mitigation activities with the Army Corps of Engineers.
- Implement programs to restore connectivity with flood plains.

Issue:

- There is a lack of data on species present, and habitat needs.

Strategies:

- Conduct wildlife surveys.
- Conduct studies of habitat needs of species that inhabit the area.
- Conduct studies on habitat quality and quantity.

Issue:

- The introduction of Bighead carp, the Asian clam and other introduced species has had negative impacts on native fish species and habitats.

Strategies:

- Study impact of Bighead carp and other introduced species on native species.
- Prohibit importation of non-native fish.
- Develop ”clean” list of species allowed in Kansas to complement the Lacy Act.
- Educate the public regarding the importance of keeping invasive species out.
- The Kansas Dept. of Wildlife and Parks needs to develop a Sensitive Species Conservation Plan program.
- Expand cooperative programs that supply technical and direct assistance for nuisance animal control problems and efforts.
- Develop plans to prevent the invasion of exotic fish such as round gobies, *Neogobius melanostomus*, European ruffe, *Gymnocephalus cernuus*, and black carp, *Mylopharyngodon piceus*.

Monitoring of Aquatic Eastern Large Rivers Habitat

- Monitor discharges from ships.
- Establish and monitor storm flows.
- Use identifier species (indicator species) to monitor the health of this habitat.
- Develop baseline data for habitat quality and quantity.
- Implement a long term monitoring program of the baseline data.
- Institute a public and private landowner survey of current management practices and repeated periodically.
- Collect demographic data and monitor public attitudes toward large rivers.
- Monitor species vulnerable to fragmentation and track future changes.
- Monitor water quality.
- Monitor number of easements.
- Use Kansas Data Access and Support Center **(**DASC) data for baseline data on riparian vegetation.

Potential Partners for the Eastern Tallgrass Prairie Conservation Region

- All universities
- America Tree Farm System
- American Rivers
- Chambers of commerce
- Chemical companies
- Conservation districts
- Friends of the KAW
- Farm Services Agency
- Kansas Association for Conservation and Environmental Education
- Kansas Association of Conservation Districts
- Kansas Aquatic Nuisance Species Task Force
- Kansas Biological Survey
- Kansas Canoe Association
- Kansas Chapter of the American Fisheries Society

- Kansas Department of Agriculture
- Kansas Dept. of Agriculture, Div. of Water Resources
- Kansas Department of Health and Environment
- Kansas Department of Tourism
- Kansas Department of Transportation
- Kansas Department of Wildlife and Parks
- Kansas Dept. of Education
- Kansas Farm Bureau
- Kansas Farm Service
- Kansas Fish Growers Association
- Kansas Forest Service
- Kansas Forest Products Association
- Kansas Lake Associations
- Kansas Native Plant Society
- Kansas Rural Center
- Kansas State Conservation Commission
- Kansas State University Extension Service
- Kansas Water Office
- Kansas Alliance for Wetlands and Streams
- Kansas Herpetological Society
- Kansas Livestock Association
- Konza Prairie Preserve, LTER
- Landowners
- Legislators - state and federal
- Local and county governments
- Media
- Mississippi Interstate Cooperative Resource Association (MICRA)
- Military Installations
- Missouri River Natural Resources Committee
- National Center for Disease Control
- National Park Service
- Natural Resources Conservation Service
- Neighboring states
- Oil and gas industry
- Pet and garden stores
- Private business/industry
- Real estate agencies
- River barge companies
- State Association of Kansas RC and D Councils
- Sport Fish NGO’s
- The Nature Conservancy
- Tallgrass Legacy Alliance
- United State Army Corps of Engineers
- US Environmental Protection Administration
- US Fish and Wildlife Service Partner Programs
- US Geological Survey

- Veterinarians and local humane societies
- Walnut Council
- Watershed Districts
- Watershed protection districts
- White Water to Blue Water

PLAN REVIEW AND REVISION

The Comprehensive Wildlife Conservation Plan will require periodic review and revision. New information will become available, implemented strategies will solve issues, and new situations or circumstances will occur. As a normal part of Department of Wildlife and Parks operations, information will be accumulated continuously on Comprehensive Wildlife Conservation Plan elements for such things as status and trends of species of wildlife. This monitoring will also involve key habitat conditions and trends.

Ongoing communication and coordination with the conservation partners will help track progress and identify new circumstances or changing situations. Many of these conservation partners will contribute information gained through their normal operations which will be vital to the review and revision of the Comprehensive Wildlife Conservation Plan. Coordination (conducted mainly through email exchange between conservation partners, but including occasional meetings), is an effort to, at least annually, review the relevance of the plan with potential partners and to identify opportunities for work sharing and joint budgeting of projects. This process will be facilitated by the Department of Wildlife and Parks, but will potentially involve projects in which they do not participate directly.

Several years of results may be needed before real conservation progress can be demonstrated. Allowing for this time lag between planning, implementation of strategies, and responses of natural systems will influence Kansas' schedule for review and revision of their Comprehensive Wildlife Conservation Plan.

At five to seven-year intervals, Kansas' Comprehensive Wildlife Conservation Plan will be thoroughly and completely reviewed and revised as needed. This will include something considerably less than the level of effort put into the initial Comprehensive Wildlife Conservation Plan, but will involve all conservation partners and all eight of the initial required elements. It is thought that updating of all eight required elements can be accomplished by ongoing interactive communication with conservation partners, stakeholders, and the general public, and through use of additional Comprehensive Wildlife Conservation Questionnaires similar to the one used for this plan. As new conservation partners are identified, they will be integrated into the process.

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Appendix 1
Species of Greatest Conservation Need - Selection and Ranking

This table includes Kansas' Species of Greatest Conservation Need along with the selection criteria number and ranking scores.

			Ranking Score							
			Criteria Number							
Group	**Common Name**	**Scientific Name**	**1**	**2**	**3**	**4**	**5**	**6**	**Total Score**	**Tier**
Amphibians	Crawfish Frog	Rana areolata	2	3	1	3	1	2	12	I
Amphibians	Grotto Salamander (E)	Typhlotriton spelaeus	2	3	1	2	1	2	11	I
Amphibians	Green Toad (T)	Bufo debilis	1	3	1	2	1	2	10	II
Amphibians	Green Frog (T)	Rana clamitans	1	3	1	2	1	2	10	II
Amphibians	Strecker's Chorus Frog (T)	Pseudacris streckeri	1	3	1	2	1	2	10	II
Amphibians	Northern Cricket Frog	Acris crepitans	1	3	2	3	0	1	10	II
Amphibians	Red-spotted Toad	Bufo punctatus	1	3	1	2	1	2	10	II
Amphibians	Eastern Narrowmouth Toad (T)	Gastrophryne carolinensis	1	3	1	2	1	2	10	II
Amphibians	Oklahoma Salamander (E)	Eurycea tyenrehsis	2	3	1	2	0	2	10	II
Amphibians	Cave Salamander (E)	Eurycea lucifuga	1	3	1	2	1	2	10	II
Amphibians	Longtail Salamander (T)	Eurycea longicauda	1	3	1	2	1	2	10	II
Amphibians	Eastern Newt (T)	Notophtalmus viridescens	1	3	1	2	1	2	10	II
Amphibians	Red River Mudpuppy	Necturus louisianensis	1	3	1	2	0	2	9	III
Amphibians	Spring Peeper (T)	Pseudacris crucifer	1	3	1	2	1	1	9	III
Amphibians	Eastern Tiger Salamander	Ambystoma tigrinum	1	3	1	2	0	2	9	III
Amphibians	Pickerel Frog	Rana palustris	1	3	1	2	0	2	9	III
Amphibians	Common Mudpuppy	Necturus maculosus	1	3	1	2	0	2	9	III
Birds	Henslow's Sparrow	Ammodramus henslowii	2	3	2	3	2	3	15	I
Birds	Lesser Prairie-Chicken	Tympanuchus pallidicinctus	2	1	3	3	2	3	14	I
Birds	Ferruginous Hawk	Buteo regalis	2	3	2	3	1	3	14	I
Birds	Snowy Plover (T)	Charadrius alexandrinus	2	3	1	3	2	3	14	I
Birds	Mountain Plover	Charadrius montanus	3	3	1	2	2	3	14	I
Birds	Loggerhead Shrike	Lanius ludovicianus	2	3	1	3	1	3	13	I
Birds	Long-billed Curlew	Numenius americanus	1	3	1	3	2	3	13	I
Birds	Black Rail	Laterallus jamaicensis	2	3	1	2	2	3	13	I
Birds	Rusty Blackbird	Euphagus carolinus	2	3	1	3	1	3	13	I
Birds	Cerulean Warbler	Dendroica cerulea	2	3	1	3	1	3	13	I
Birds	Hudsonian Godwit	Limosa haemastica	2	3	1	3	1	3	13	I
Birds	Eskimo Curlew (E)	Numenius borealis	3	2	1	2	2	3	13	I
Birds	Baird's Sparrow	Ammodramus bairdii	2	3	2	2	1	3	13	I
Birds	Chihuahuan Raven	Corvus cryptoleucus	1	3	1	2	2	3	12	I
Birds	Sprague's Pipit	Anthus spragueii	2	3	1	2	1	3	12	I
Birds	Marbled Godwit	Limosa fedoa	1	3	1	3	1	3	12	I
Birds	Black-capped Vireo (E) (X)	Vireo atricapilla	3	2	1	2	2	2	12	I
Birds	Lewis's Woodpecker	Melanerpes lewis	2	3	1	2	1	3	12	I
Birds	Burrowing Owl	Athene cunicularia	2	3	1	2	1	3	12	I

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			Ranking Score							
			Criteria Number							
Group	**Common Name**	**Scientific Name**	**1**	**2**	**3**	**4**	**5**	**6**	**Total Score**	**Tier**
Birds	Black-billed Cuckoo	Coccyzus erythropthalmus	1	3	1	3	1	3	12	I
Birds	Stilt Sandpiper	Calidris himantopus	1	3	1	3	1	3	12	I
Birds	Least Tern (E)	Sterna antillarum	2	2	1	2	2	3	12	I
Birds	Bobolink	Dolichonyx orzivorus	1	3	1	3	1	3	12	I
Birds	Golden Eagle	Aquila chrysaetos	1	3	1	3	1	3	12	I
Birds	Whooping Crane (E)	Grus americana	3	2	1	1	2	3	12	I
Birds	Black-bellied Plover	Pluvialis squatarola	1	3	1	3	1	3	12	I
Birds	Piping Plover (T)	Charadrius melodius	2	2	1	2	2	3	12	I
Birds	Peregrine Falcon (E)	Falco peregrinus	2	3	1	2	1	3	12	I
Birds	Chestnut-collared Longspur	Calcarius ornatus	1	3	1	2	1	3	11	I
Birds	Ladder-backed Wodpecker	Piciodes scalaris	1	3	1	2	1	3	11	I
Birds	Long-billed Dowitcher	Limnodromus scolopaceus	1	3	1	3	1	2	11	I
Birds	Swainson's Hawk	Buteo swainsoni	1	3	1	3	1	2	11	I
Birds	Painted Bunting	Passerina ciris	1	3	1	2	1	3	11	I
Birds	Bell's Vireo	Vireo bellii	1	3	1	3	1	2	11	I
Birds	Common Poorwill	Phalaenoptilus nuttallii	1	3	1	3	1	2	11	I
Birds	Smith's Longspur	Calcarius pictus	1	3	1	2	1	3	11	I
Birds	McCown's Longspur	Calcarius mccownii	2	3	1	2	1	2	11	I
Birds	Curve-billed Thrasher	Toxostoma curcirostre	1	3	1	2	1	3	11	I
Birds	Least Bittern	Ixobrychus exilis	1	3	1	2	1	3	11	I
Birds	Little Blue Heron	Egretta caerulea	1	3	1	2	1	3	11	I
Birds	Cassin's Sparrow	Aimophila cassinii	1	3	1	2	1	3	11	I
Birds	Prothonotary Warbler	Protonotaria citrea	1	3	1	2	1	3	11	I
Birds	Kentucky Warbler	Oporornis formosus	1	3	1	3	1	2	11	I
Birds	Yellow-throated Warbler	Dendroica dominica	1	3	1	2	1	3	11	I
Birds	Black-crowned Night-Heron	Nycticorax nycticorax	1	3	1	2	1	3	11	I
Birds	Black Tern	Chlidonias niger	2	3	1	2	1	2	11	I
Birds	Pectoral Sandpiper	Calidris melanotos	1	3	1	2	1	3	11	I
Birds	Black-necked Stilt	Himantopus mexicanus	1	3	1	2	1	3	11	I
Birds	American Golden-Plover	Pluvialis dominica	1	3	1	3	1	2	11	I
Birds	Brewer's Blackbird	Euphagus cyanocephalus	1	3	1	2	1	3	11	I
Birds	Buff-breasted Sandpiper	Tryngites subruficollis	1	3	1	2	1	3	11	I
Birds	Forster's Tern	Sterna forsteri	1	3	1	2	1	3	11	I
Birds	Barn Owl	Tyto alba	1	3	1	3	0	3	11	I
Birds	Whip-poor-will	Caprimulgus vociferus	1	3	1	3	1	2	11	I
Birds	Greater Prairie-Chicken	Tympanuchus cupido	2	1	3	2	1	2	11	I
Birds	Short-eared Owl	Asio flammeus	1	3	1	2	1	3	11	I
Birds	Great Egret	Ardea alba	1	3	1	2	1	2	10	II
Birds	Upland Sandpiper	Bartramia longicauda	1	3	2	2	1	1	10	II
Birds	Pileated Woodpecker	Dryocopus pileatus	1	3	1	1	1	3	10	II
Birds	Least Sandpiper	Calidris minutilla	1	3	1	2	1	2	10	II

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			Ranking Score							
			Criteria Number							
Group	**Common Name**	**Scientific Name**	**1**	**2**	**3**	**4**	**5**	**6**	**Total Score**	**Tier**
Birds	Brown Thrasher	Toxostoma rufum	1	3	1	3	1	1	10	II
Birds	American Bittern	Botaurus lentiginosus	2	1	1	2	1	3	10	II
Birds	American Avocet	Recurvirostra americana	1	3	1	2	1	2	10	II
Birds	Greater Yellowlegs	Tringa melanoleuca	1	3	1	2	1	2	10	II
Birds	Barn Swallow	Hirundo rustica	1	3	1	3	0	2	10	II
Birds	Lesser Yellowlegs	Tringa flavipes	1	3	1	2	1	2	10	II
Birds	Chuck-will's-widow	Caprimulgus carolinensis	1	3	1	2	1	2	10	II
Birds	Bald Eagle (T)	Haliaeetus leucocephalus	2	2	1	1	1	3	10	II
Birds	Common Nighthawk	Chordeiles minor	1	3	1	2	1	2	10	II
Birds	Northern Pintail	Anas acuta	1	1	1	3	1	3	10	II
Birds	Eastern Wood-Pewee	Contopus virens	1	3	1	3	1	1	10	II
Birds	Scissor-tailed Flycatcher	Tyrannus forficatus	1	3	2	2	1	1	10	II
Birds	Baird's Sandpiper	Calidris bairdii	1	3	1	2	1	2	10	II
Birds	Orchard Oriole	Icterus spurius	1	3	1	2	1	2	10	II
Birds	Eastern Meadowlark	Sturnella magna	1	3	1	3	1	1	10	II
Birds	Baltimore Oriole	Icterus galbula	1	3	1	3	1	1	10	II
Birds	Bullock's Oriole	Icterus bullockii	1	3	1	2	1	2	10	II
Birds	Dickcissel	Spiza americana	1	3	1	3	1	1	10	II
Birds	Spotted Towhee	Pipilo maculatus	1	3	1	2	1	2	10	II
Birds	Lark Sparrow	Chondestes grammacus	1	3	1	3	1	1	10	II
Birds	Lark Bunting	Calamospiza melanocorys	1	3	1	3	1	1	10	II
Birds	Grasshopper Sparrow	Ammodramus savannarum	1	3	1	3	1	1	10	II
Birds	Wilson's Phalarope	Phalaropus tricolor	1	3	1	2	1	1	9	III
Birds	Western Grebe	Aechmophorus occidentalis	1	1	1	2	1	3	9	III
Birds	Eared Grebe	Podiceps nigricollis	1	1	1	2	1	3	9	III
Birds	Louisiana Waterthrush	Seiurus motacilla	1	3	1	2	0	2	9	III
Birds	American White Pelican	Pelecanus erythrorhynchos	2	3	1	1	0	2	9	III
Birds	Snowy Egret	Egretta thula	1	3	1	1	1	2	9	III
Birds	Semipalmated Sandpiper	Calidris pusilla	1	3	1	2	1	1	9	III
Birds	Canvasback	Aythya valisineria	1	1	1	2	1	3	9	III
Birds	Mississippi Kite	Ictinia mississippiensis	1	3	1	1	1	2	9	III
Birds	White-rumped Sandpiper	Calidris fuscicollis	1	3	1	2	1	1	9	III
Birds	Northern Bobwhite	Colinus virginianus	1	1	1	3	1	2	9	III
Birds	American Tree Sparrow	Spizella arborea	1	3	1	2	1	1	9	III
Birds	Red-headed Woodpecker	Melanerpes erythrocephalus	1	3	1	2	1	1	9	III
Birds	Harris' Sparrow	Zonotrichia querula	1	3	1	2	1	1	9	III
Birds	Eastern Kingbird	Tyrannus tyrannus	1	3	1	2	1	1	9	III
Birds	Western Kingbird	Tyrannus verticalis	1	3	1	2	1	1	9	III
Birds	Field Sparrow	Spizella pusilla	1	3	1	2	1	1	9	III
Birds	Scaled Quail	Callipepla squamata	1	1	1	2	0	3	8	III
Crustaceans	Neosho Midget Crayfish	Orconectes macrus	2	3	1	2	1	3	12	I

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			Ranking Score							
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Group	**Common Name**	**Scientific Name**	**1**	**2**	**3**	**4**	**5**	**6**	**Total Score**	**Tier**
Crustaceans	A Crayfish	Orconectes palmeri	1	3	1	2	0	3	10	II
Crustaceans	A Crayfish	Orconectes luteus	1	3	1	2	0	3	10	II
Crustaceans	A Crayfish	Procambarus simulans	1	3	1	2	0	2	9	III
Crustaceans	Prairie Crayfish	Procambarus gracilis	1	3	1	2	0	2	9	III
Crustaceans	A Crayfish	Orconectes neglectus	1	3	1	2	0	2	9	III
Crustaceans	A Crayfish	Orconectes nais	1	3	1	2	0	2	9	III
Crustaceans	Devil Crayfish	Orconectes diogenes	1	3	1	2	0	2	9	III
Crustaceans	Calico Crayfish	Orconectes immunis	1	3	1	2	0	2	9	III
Crustaceans	Virile Crayfish	Orconectes virilis	1	3	1	2	0	1	8	III
Fish	Arkansas Darter (T)	Etheostoma cragini	2	3	2	3	1	3	14	I
Fish	Sturgeon Chub (T)	Macrhybopsis gelida	3	3	1	3	1	3	14	I
Fish	Neosho Madtom (T)	Noturus placidus	3	2	3	2	1	3	14	I
Fish	Topeka Shiner (T)	Notropis topeka	3	2	2	3	1	3	14	I
Fish	Peppered Chub (E)	Macrhyhopsis tetranema	3	3	2	3	0	3	14	I
Fish	Northern Plains Killifish	Fundulus kansae	1	3	3	3	0	3	13	I
Fish	River Redhorse	Moxostoma carinatum	2	3	1	3	1	3	13	I
Fish	Arkansas River Shiner (X) (E)	Notropis girardi	3	2	1	3	1	3	13	I
Fish	Pallid Sturgeon (E)	Scaphirhynchus albus	3	2	1	3	1	3	13	I
Fish	Redspot Chub (T)	Nocomis asper	2	3	1	3	1	3	13	I
Fish	Western Silvery Minnow (T)	Hybognathus argyritis	2	3	1	3	1	3	13	I
Fish	Cardinal Shiner	Luxilus cardinalis	2	3	3	2	0	3	13	I
Fish	Sicklefin Chub (E)	Macrhybopsis meeki	2	3	1	3	1	3	13	I
Fish	Plains Minnow	Hybognathus placitus	2	3	1	3	1	3	13	I
Fish	Hornyhead Chub (T)	Nocomis biguttatus	1	3	1	3	1	3	12	I
Fish	Brassy Minnow	Hybognathus hankinsoni	1	3	1	3	1	3	12	I
Fish	Gravel Chub	Erimystax x-punctatus	2	3	1	2	1	3	12	I
Fish	Banded Sculpin	Cottus carolinae	1	3	1	3	1	3	12	I
Fish	Spotted Sucker	Minytrema melanops	1	3	1	3	1	3	12	I
Fish	Greenside Darter	Etheostoma blennioides	1	3	1	3	1	3	12	I
Fish	Chestnut Lamprey (T)	Ichthyomyzon castaneus	2	3	1	2	1	3	12	I
Fish	Stippled Darter	Etheostoma punctulatum	2	3	1	2	1	3	12	I
Fish	Blackside Darter (T)	Percina maculata	1	3	1	3	1	3	12	I
Fish	Spotfin Shiner	Cyprinella spiloptera	1	3	1	3	1	3	12	I
Fish	Southern Redbelly Dace	Phoxinus erythrogaster	1	3	1	3	1	3	12	I
Fish	Highfin Carpsucker	Carpiodes velifer	2	3	1	3	0	3	12	I
Fish	Silverband Shiner (T)	Notropis shumardi	1	3	1	3	1	3	12	I
Fish	Flathead Chub (T)	Platygobio gracilis	1	3	1	3	1	3	12	I
Fish	Northern Hog Sucker	Hypentelium nigricans	1	3	1	3	1	3	12	I
Fish	River Shiner	Notropis blennius	1	3	1	2	1	3	11	I
Fish	Banded Darter	Etheostoma zonale	1	3	1	2	1	3	11	I
Fish	Ozark Minnow	Notropis nubilus	1	3	1	2	1	3	11	I

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			Ranking Score							
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Group	**Common Name**	**Scientific Name**	**1**	**2**	**3**	**4**	**5**	**6**	**Total Score**	**Tier**
Fish	Slough Darter	Etheostoma gracile	1	3	1	2	1	3	11	I
Fish	Bluntnose Darter	Etheostoma chlorosoma	1	3	1	2	1	3	11	I
Fish	River Darter	Percina shumardi	1	3	1	2	1	3	11	I
Fish	Common Shiner	Luxilus cornutus	1	3	1	3	0	3	11	I
Fish	Black Redhorse	Moxostoma duquesnei	1	3	1	2	1	3	11	I
Fish	American Eel	Anguilla rostrata	1	3	1	3	0	3	11	I
Fish	Brindled Madtom	Noturus miurus	1	3	1	2	1	3	11	I
Fish	Western Blacknose Dace	Rhinichthys obtusus	1	3	1	2	1	3	11	I
Fish	Tadpole Madtom	Noturus gyrinus	1	3	1	2	1	3	11	I
Fish	Quillback	Carpiodes cyprinus	1	3	1	2	1	3	11	I
Fish	Silver Chub (E)	Macrhybopsis storeriana	1	3	1	3	0	3	11	I
Fish	Blue Sucker	Cycleptus elongatus	2	3	1	2	1	2	11	I
Fish	Bigeye Chub (X)	Hybopsis amblops	1	3	1	3	0	3	11	I
Fish	Shoal Chub	Macrhybopsis hyostoma	1	3	1	3	0	3	11	I
Fish	Speckled Darter	Etheostoma stigmaeum	1	3	1	2	0	3	10	II
Fish	Channel Darter	Percina copelandi	2	3	1	2	0	2	10	II
Fish	Bigeye Shiner	Notropis boops	1	3	1	2	0	3	10	II
Fish	White Sucker	Catostomus commersonii	1	3	1	2	0	3	10	II
Fish	Black Buffalo	Ictiobus niger	1	3	1	2	0	3	10	II
Fish	Johnny Darter	Etheostoma nigrum	1	3	1	3	0	2	10	II
Fish	Shovelnose Sturgeon	Scaphirhynchus platorynchus	1	3	1	2	0	3	10	II
Fish	Least Darter	Etheostoma microperca	1	3	1	2	0	3	10	II
Fish	Redfin Darter	Etheostoma whipplei	1	3	1	2	0	3	10	II
Fish	Fantail Darter	Etheostoma flabellare	1	3	1	2	0	3	10	II
Fish	Shorthead Redhorse	Moxostoma macrolepidotum	1	3	1	2	0	2	9	III
Fish	Golden Redhorse	Moxostoma erythrurum	1	3	1	2	0	2	9	III
Fish	Spotted Gar	Lespisosteus oculatus	1	3	1	2	0	2	9	III
Fish	Freckled Madtom	Noturus nocturnus	1	3	1	2	0	2	9	III
Fish	Slender Madtom	Noturus exilis	1	3	1	2	0	2	9	III
Fish	Logperch	Percina caprodes	1	3	1	2	0	1	8	III
Fish	Orangethroat Darter	Etheostoma spectabile	1	3	1	2	0	1	8	III
Fish	Slenderhead Darter	Percina phoxocephala	1	3	1	2	0	1	8	III
Fish	Stonecat	Noturus flavus	1	3	1	2	0	1	8	III
Fish	Warmouth	Lepomis gulosus	1	1	1	2	0	3	8	III
Fish	Paddlefish	Polyodon spathula	1	1	1	2	0	2	7	III
Gastropods	Sharp Hornsnail (T)	Pleurocera acuta	1	3	1	2	1	3	11	I
Gastropods	Slender Walker Snail (E)	Pomatiopsis lapidaria	1	3	1	2	1	3	11	I
Gastropods	Delta hydrobe	Probythinella emarginata	1	3	1	2	0	3	10	II
Insect	Scott Optioservus Beetle (E)	Optioservus phaeus	3	3	3	2	2	3	16	I
Insect	Prairie Mole Cricket	Gryllotalpa major	2	3	3	2	1	3	14	I
Insect	A Mayfly (From Ks.)	Leptophlebia konza	3	3	3	2	0	3	14	I

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			Ranking Score							
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Group	**Common Name**	**Scientific Name**	**1**	**2**	**3**	**4**	**5**	**6**	**Total Score**	**Tier**
Insect	Ozark Emerald	Somatochlora ozarkensis	2	3	2	2	1	3	13	I
Insect	American Burying Beetle (E)	Nicrophorus americanus	3	2	1	2	2	3	13	I
Insect	Gray Petaltail	Tachopteryx thoreyi	2	3	1	2	1	3	12	I
Insect	Linda's Roadside Skipper	Amblyscirtes linda	3	3	1	2	0	3	12	I
Insect	Austin Springfly	Hydroperla fugitans	2	3	1	2	0	3	11	I
Insect	A Spur-throat Grasshopper	Melanoplus beameri	3	3	1	2	0	2	11	I
Insect	Sage Sphinx	Sphinx eremitoides	3	3	1	2	0	2	11	I
Insect	Two-spotted Skipper	Euphyes bimacula illinois	2	3	1	2	0	2	10	II
Insect	A Prongill Mayfly	Paraleptophlebia calcarica	3	3	0	2	0	2	10	II
Insect	A Mayfly	Siphlonurus minnoi	2	3	1	2	0	2	10	II
Insect	Low-ridged Pygmy Grasshopper	Nomotettix parvus	2	3	1	2	0	2	10	II
Insect	Whitney's Underwing	Catocala whitneyi	2	3	1	2	0	2	10	II
Insect	Bell's Roadside Skipper	Amblyscirtes belli	2	3	1	2	0	2	10	II
Insect	Bleached Skimmer	Libellula composita	2	3	1	2	0	2	10	II
Insect	Ozark Springfly	Helopicus nalatus	2	3	1	2	0	2	10	II
Insect	Arogos Skipper	Atrytone arogos	2	3	1	2	0	2	10	II
Insect	Byssus Skipper	Problema byssus	2	3	1	2	0	2	10	II
Insect	Dotted Skipper	Hesperia attralus attalus	2	3	1	2	0	2	10	II
Insect	Ottoe Skipper	Hesperia ottoe	2	3	1	2	0	2	10	II
Insect	Mottled Duskywing	Erynnis martialis	2	3	1	2	0	2	10	II
Insect	Regal Fritillary	Speyeria idalia	2	3	1	2	0	2	10	II
Insect	Monarch	Danaus plexippus	1	3	1	3	0	1	9	III
Isopods	A Cave Isopod	Caecidotea metcalfi	3	3	0	2	0	2	10	II
Isopods	An Isopod	Caecidotea tridentata	3	3	0	2	0	2	10	II
Isopods	A cave obligate isopod	Caecidotea simulator	3	3	0	2	0	2	10	II
Isopods	An isopod	Caecidotea steevesi	2	3	0	2	0	2	9	III
Mammals	Black-tailed Prairie Dog	Cynomys ludovicianus	2	3	2	3	1	3	14	I
Mammals	Townsend's Big-eared Bat	Corynorhinus townsendii	2	3	1	2	1	3	12	I
Mammals	Black-footed Ferret (E) (X)	Mustela nigripes	3	2	2	2	1	2	12	I
Mammals	Spotted Skunk (T)	Spilogale putorius	1	3	1	2	2	3	12	I
Mammals	Southern Flying Squirrel	Glaucomys volans	1	3	1	2	1	3	11	I
Mammals	Franklin's Ground Squirrel	Spermophilus franklinii	1	3	1	2	1	3	11	I
Mammals	Pallid Bat	Antrozous pallidus	1	3	1	2	1	3	11	I
Mammals	Southern Bog Lemming	Synaptomys cooperi	1	3	1	2	1	3	11	I
Mammals	Gray Myotis (E)	Myotis grisescens	2	2	1	2	1	3	11	I
Mammals	Little Brown Myotis	Myotis lucifugus	1	3	1	3	0	3	11	I
Mammals	American Black Bear (X)	Ursus americanus	1	3	1	2	0	3	10	II
Mammals	Swift Fox	Vulpes velox	2	3	1	2	1	1	10	II
Mammals	Texas Mouse	Peromyscus attwateri	1	3	1	2	1	2	10	II
Mammals	Western Small-footed Myotis	Myotis ciliolabrum	1	3	1	2	0	3	10	II
Mammals	Fulvous Harvest Mouse	Reithrodontomys fulvescens	1	3	1	2	0	3	10	II

Appendix 1
Species of Greatest Conservation Need - Selection and Ranking

			Ranking Score							
			Criteria Number							
Group	**Common Name**	**Scientific Name**	**1**	**2**	**3**	**4**	**5**	**6**	**Total Score**	**Tier**
Mammals	Spotted Ground Squirrel	Spermophilus spilosoma	1	3	2	2	0	2	10	II
Mammals	Yellow-faced Pocket Gopher	Cratogeomys castanops	1	3	1	2	0	2	9	III
Mammals	Common Gray Fox	Urocyon cinereoargenteus	1	1	1	2	0	3	8	III
Mammals	Mountain Lion	Puma concolor	1	1	1	2	0	3	8	III
Mammals	Swamp Rabbit (X)	Sylvilagus aquaticus	1	1	1	2	0	3	8	III
Mammals	White-tailed Jack Rabbit	Lepus townsendii	1	1	1	2	0	2	7	III
Mussels	Neosho Mucket (E)	Lampsilis rafinesqueana	3	2	3	3	2	3	16	I
Mussels	Western Fanshell (E)	Cyprogenia aberti	3	3	2	2	1	3	14	I
Mussels	Rabbitsfoot (E)	Quadrula cylindrica cylindrica	2	3	1	3	1	3	13	I
Mussels	Round Pigtoe Mussel	Pleurobema sintoxia	2	3	1	3	1	3	13	I
Mussels	Butterfly (T)	Ellipsaria lineolata	2	3	1	3	1	3	13	I
Mussels	Spectaclecase (X)	Cumberlandia monodonta	3	3	1	2	1	3	13	I
Mussels	Elktoe (E)	Alasmidonta marginata	2	3	1	3	1	3	13	I
Mussels	Cylindrical Papershell	Anodontoides ferussacianus	1	3	1	3	1	3	12	I
Mussels	Spike	Elliptio dilatata	1	3	1	3	1	3	12	I
Mussels	Fluted-Shell (T)	Lasmigona costata	1	3	1	3	1	3	12	I
Mussels	Ouachita Kidneyshell (T)	Ptychobranchus occidentalis	2	3	1	2	1	3	12	I
Mussels	Ellipse Mussel (E)	Venustaconcha ellipsiformis	2	3	1	2	1	3	12	I
Mussels	Wartyback	Quadrula nodulata	2	3	1	2	1	3	12	I
Mussels	Deertoe	Truncilla truncata	1	3	1	3	1	3	12	I
Mussels	Rock-Pocketbook (T)	Arcidens confragosus	2	3	1	2	0	3	11	I
Mussels	Pondhorn	Uniomerus tetralasmus	2	3	1	2	0	3	11	I
Mussels	Yellow Sandshell	Lampsilis teres	1	3	1	2	1	3	11	I
Mussels	Fatmucket	Lampsilis siliquoidea	1	3	1	3	1	2	11	I
Mussels	Mucket (E)	Actinonaias ligamenta	1	3	1	3	0	3	11	I
Mussels	Snuffbox (X)	Epioblasma triquetra	2	3	1	2	1	2	11	I
Mussels	Black Sandshell (X)	Ligumia recta	1	3	1	3	0	3	11	I
Mussels	Flat Floater	Anodonta suborbiculata	1	3	1	2	1	3	11	I
Mussels	Pink Heelsplitter	Potamilus alatus	1	3	1	3	0	2	10	II
Mussels	Plain Pocketbook	Lampsilis cardium	1	3	1	3	0	2	10	II
Mussels	Purple Wartyback	Cyclonaias tuberculata	1	3	1	2	0	3	10	II
Mussels	Slippershell (X)	Alasmidonta viridis	2	3	1	2	0	2	10	II
Mussels	Monkeyface	Quadrula metanevra	2	3	1	2	0	2	10	II
Mussels	Pistolgrip	Tritogonia verrucosa	2	3	1	2	0	2	10	II
Mussels	Fawnsfoot	Truncilla donaciformis	1	3	1	2	1	2	10	II
Mussels	Wabash Pigtoe	Fusconaia flava	1	3	1	2	1	2	10	II
Mussels	Washboard	Megalonaias nervosa	1	3	1	2	1	2	10	II
Mussels	Bleufer	Potamilus purpuratus	1	3	1	3	0	2	10	II
Mussels	Creeper	Strophitus undulatus	1	3	1	2	0	2	9	III
Mussels	Pimpleback	Quadrula pustulosa	1	3	1	2	0	2	9	III
Mussels	Threeridge	Amblema plicata	1	3	1	3	0	1	9	III

Appendix 1
Species of Greatest Conservation Need - Selection and Ranking

			Ranking Score							
			Criteria Number							
Group	**Common Name**	**Scientific Name**	**1**	**2**	**3**	**4**	**5**	**6**	**Total Score**	**Tier**
Mussels	White Heelsplitter	Lasmigona complanata	1	3	1	2	0	2	9	III
Mussels	Threehorn Wartyback	Obliquaria reflexa	1	3	1	2	0	2	9	III
Mussels	Pondmussel	Ligumia subrostrata	2	3	1	2	0	1	9	III
Mussels	Lilliput	Toxoplasma parvus	1	3	1	2	0	2	9	III
Mussels	Giant Floater	Pyganodon grandis	1	3	1	2	0	1	8	III
Mussels	Mapleleaf	Quadrula quadrula	1	3	1	2	0	1	8	III
Mussels	Fragile Papershell	Leptodea fragilis	1	3	1	1	0	1	7	III
Mussels	Pink Papershell	Potamilus ohiensis	1	3	1	1	0	1	7	III
Planarians	Kansas Planarian	Sphalloplana kansensis	3	3	3	2	0	2	13	I
Reptiles	Timber Rattlesnake	Crotalus horridus	2	3	1	3	1	2	12	I
Reptiles	Checkered Garter Snake (T)	Thamnophis marcianus	1	3	1	2	1	3	11	I
Reptiles	Redbelly Snake (T)	Storeria occipitomaculata	1	3	1	2	1	3	11	I
Reptiles	Lesser Earless Lizard	Holbrookia maculata	1	3	2	3	0	2	11	I
Reptiles	Massasauga	Sistrurus catenatus	2	3	1	2	1	1	10	II
Reptiles	Western Hognose Snake	Heterodon nasicus	1	3	1	2	1	2	10	II
Reptiles	Texas Horned Lizard	Phrynosoma cornutum	2	3	2	2	0	1	10	II
Reptiles	Eastern Hognose Snake	Heterodon platirhinos	1	3	1	2	1	2	10	II
Reptiles	Broadhead Skink (T)	Eumeces laticeps	1	3	1	2	1	2	10	II
Reptiles	Coal Skink	Eumeces anthracinus	1	3	1	2	0	3	10	II
Reptiles	Rough Earth Snake	Virginia striatula	1	3	1	2	1	2	10	II
Reptiles	Smooth Earth Snake (T)	Virginia valeriae	1	3	1	2	1	2	10	II
Reptiles	Cottonmouth	Agkistrodon piscivorus	1	3	1	2	0	3	10	II
Reptiles	Common Garter Snake	Thamnophis sirtalis annectens	1	3	1	2	0	2	9	III
Reptiles	Ground Snake	Sonora semiannulata	1	3	1	2	0	2	9	III
Reptiles	Longnose Snake (T)	Rhinocheilus lecontei	1	3	1	2	0	2	9	III
Reptiles	Eastern Glossy Snake	Arizona elegans	1	3	1	2	0	2	9	III
Reptiles	Night Snake	Hypsiglena torquata	1	3	1	2	1	1	9	III
Reptiles	Texas Blind Snake (T)	Leptotyphlops dulcis	1	3	1	2	1	1	9	III
Reptiles	Prairie Rattlesnake	Crotalus viridis	1	3	1	2	0	1	8	III
Reptiles	Rough Green Snake	Opheodrys aestivus	1	3	1	2	0	1	8	III
Reptiles	Milk Snake	Lampropeltis triangulum	1	3	1	2	0	1	8	III
Turtles	Common Map Turtle (T)	Graptemys geographica	1	3	1	3	1	3	12	I
Turtles	Alligator Snapping Turtle	Macrochelys temminckii	2	3	1	2	1	3	12	I
Turtles	Smooth Softshell	Apalone mutica	1	1	2	3	0	2	9	III

Appendix 2
Kansas' Selection and Ranking Criteria for Species of Greatest Conservation Need

Step 1: Selection of Species of Greatest Conservation Need; a species must meet one or more of the following criteria.

1. Native species, which are, listed as federal candidate under the ESA

2. Native species, which are classified as Kansas threatened, endangered, or Species In Need of Conservation

3. Native species, which have been assigned global ranking scores of G1, G2 or G3 by the Kansas Natural Heritage Program.

4. Native species which have been identified as conservation priorities through a range wide status assessment, or assessment of large taxonomic divisions or which has significant conservation implication, or has major conservation contribution to the state; or are indicative of a diversity and health of the state's wildlife. Examples of these include: assessments of freshwater fish, freshwater mussels and crayfish by the American Fisheries Society, or bird conservation plans, such as the national Partners In Flight Conservations Plan, Playa Lakes Joint Venture, Upper Mississippi and Great Lakes Joint Venture, Waterfowl Conservation Plan and the U.S. Shorebird Conservation Plan.

5. Native reptile, amphibian, fish and mussel species which are subject to commercial harvest in Kansas but are not eligible for funding under PR/DJ or ESA federal aid programs in order to monitor or periodically assess their status.

6. Native species, which are regionally endemic regardless of their conservation status.

Step 2: Ranking of Species of Greatest Conservation Need

Criterion 1 -- Natural Heritage Global Rank: The network of State Natural Heritage Inventory Programs ranks all species on a scale of G1 through G5 with G1 species being the most imperiled and G5 species being the most secure. Each species' Natural Heritage Global Rank is identical across its range in the United States and can be obtained from the NatureServe Website - http://www.natureserve.org.

- 3 points - Species has a Global Heritage Rank of G1 or G2
- 2 points - Species has a Global Heritage Rank of G3 or G4
- 1 point - Species has a Global Heritage Rank of G5

Criterion 2 -- Availability of Other Federal Aid Funding Sources: One of the selling points used to develop support for the State Wildlife Grants program in Congress has been that it meets unfunded wildlife conservation needs. As such, state wildlife agencies have been cautioned against using these funds to supplement traditional

management program such as - endangered and threatened species recovery, sport fish management or game management. Incorporating this criterion does not eliminate endangered, threatened, game and sport fish species from the list of species of greatest conservation need, but it does lower their ranking relative to other species.

- 3 points - Species is not Eligible for Management Funding Under ESA, P-R or D-J Programs (Federal Aid in Sport Fish & Wildlife Restoration Programs)
- 2 points - Species is Listed as Federally Endangered or Threatened and is Eligible for Management Funding under the Endangered Species Act
- 1 point - Species is Eligible for Management Funding as a Sport Fish, Game Bird or Game Mammal

Criterion 3 -- Percent of Population Size or Geographic Range within Kansas: A species receives a higher score if it is found only in Kansas and/or a few surrounding states and a lower score if Kansas is on the periphery of its range.

- 3 points - Kansas encompasses >25% of the species' range or population
- 2 points - Kansas encompasses 5-25% of the species range or population
- 1 point - Kansas encompasses < 5% of the species range or population

Criterion 4 -- Trend in Population Size or Geographic Range over the Past 40 Years: Forty years is our recommended window of measurement, because 1) the best population estimates and records only go back 20 to 60 years depending upon the species, 2) the narrow time frame better reflects current trends and habitat conditions.

- 3 points - Species has had a Documented Population or Range Decline During the Past 40 Years
- 2 points - Species Appears to have been Stable or the Population Trend is Unknown (this applies to most species)
- 1 point - Species has had a Documented Population or Range Increase during the Past 40 Years

Criterion 5 -- Availability of Existing Data to Support Inclusion of the Species as a Species of Greatest Conservation Need: A species receives one point for each of the three items listed below (max. of 3 total points). One of the arguments in favor of new federal aid funding for wildlife conservation has been the need to support proactive conservation measures that could head-off population declines and prevent the need for additional Endangered Species Act listings. Federal Candidate species have been identified as those species at greatest risk of endangerment, therefore they receive an additional point above all other species within this criterion. Points are added to the species' score if it has been previously identified as conservation concern through a public process such as a state or federal listing or has been identified as conservation concern in a peer-reviewed publication that evaluates the conservation status of a large taxonomic group or a species throughout its range. Part of the rationale is to acknowledge those species which have been previously identified as a conservation concern through other processes as well as those species which are regionally endemic but appear to have stable or secure populations. It also gives added weight to the species where the data are most robust regarding its conservation status.

Appendix 2
Kansas' Selection and Ranking Criteria for Species of Greatest Conservation Need

- 1 point - species has been listed state endangered, threatened, or species in need of conservation
- 1 point - species has been identified as a conservation priority in a status assessment or similar peer-reviewed publication, BUT NOT FEDERALLY LISTED
- 1 point - species has been identified as federally endangered, threatened, or proposed for listing

Criterion 6 -- Population Status in Kansas: Purpose is to give weight to species that have not been listed federally yet, so as to prevent their listing.

- Rate abundance on scale of 1-3 with 1 being abundant, 3 rare. If unknown, rate as a 2.

Appendix 3
Kansas's species that did not meet the Species of Greatest Conservation Need criteria.

Group	Common Name	Scientific Name
Insect	Six-banded Longhorn Beetle	*Dryobius sexnotatus*
Insect	Black Lordithon Rove Beetle	*Lordithon niger*
Insect	A Tiger Beetle	*Amblycheila cylindriformis*
Insect	A Tiger Beetle	*Cicindela belfragei*
Insect	A Tiger Beetle	*Cicindela celeripes*
Insect	A Tiger Beetle	*Cicindela circumpicta johnsonii*
Insect	A Tiger Beetle	*Cicindela cuprascens*
Insect	A Tiger Beetle	*Cicindela cursitans*
Insect	A Tiger Beetle	*Cicindela denverensis*
Insect	A Tiger Beetle	*Cicindela duodecimguttata*
Insect	A Tiger Beetle	*Cicindela formosa*
Insect	A Tiger Beetle	*Cicindela fulgida*
Insect	Beach-dune Tiger Beetle	*Cicindela hirticollis*
Insect	A Tiger Beetle	*Cicindela lengi*
Insect	Little White Tiger Beetle	*Cicindela lepida*
Insect	A Tiger Beetle	*Cicindela circumpicta*
Insect	A Tiger Beetle	*Cicindela limbalis*
Insect	A Tiger Beetle	*Cicindela limbalis transfersa*
Insect	A Tiger Beetle	*Cicindela macra*
Insect	A Tiger Beetle	*Cicindela macra fluviatilis*
Insect	A Tiger Beetle	*Cicindela nevadica*
Insect	A Tiger Beetle	*Cicindela nevadica knausi*
Insect	A Tiger Beetle	*Cicindela nigrocoerulea*
Insect	A Tiger Beetle	*Cicindela obsoleta*
Insect	A Tiger Beetle	*Cicindela pulchra*
Insect	A Tiger Beetle	*Cicindela punctulata*
Insect	A Tiger Beetle	*Cicindela purpurea*
Insect	A Tiger Beetle	*Cicindela purpurea audubonii*
Insect	A Tiger Beetle	*Cicindela scutellaris*
Insect	A Tiger Beetle	*Cicindela repanda*
Insect	A Tiger Beetle	*Cicindela scutellaris lecontei*
Insect	A Tiger Beetle	*Cicindela sexguttata*
Insect	A Tiger Beetle	*Cicindela splendida*
Insect	A Tiger Beetle	*Cicindela splendida cyanocephalata*
Insect	A Tiger Beetle	*Cicindela tenuisignata*
Insect	A Tiger Beetle	*Cicindela togata*
Insect	A Tiger Beetle	*Cicindela togata globicollis*
Insect	A Tiger Beetle	*Cicindela tranquebarica*
Insect	A Tiger Beetle	*Cicindela willistoni*

Group	Common Name	Scientific Name
Insect	A Tiger Beetle	*Cicindela willistoni hirtifrons*
Insect	A Tiger Beetle	*Tetracha carolina*
Insect	Virginia Big-headed Tiger Beetle	*Tetracha virginica*
Insect	Pipevine Swallowtail	*Battus philenor*
Insect	Zebra Swallowtail	*Eurytides marcellus*
Insect	Black Swallowtail	*Papilio polyxenes*
Insect	Baird's Swallowtail	*Papilio machaon bairdii*
Insect	Thoas Swallowtail	*Papilio thoas*
Insect	Giant Swallowtail	*Papilio cresphontes*
Insect	Ornythion Swallowtail	*Papilio ornythion*
Insect	Eastern Tiger Swallowtail	*Papilio glaucus*
Insect	Two-tailed Swallowtail	*Papilio multicaudata*
Insect	Spicebush Swallowtail	*Papilio troilus*
Insect	Ruby spotted Swallowtail	*Papilio anchisiades*
Insect	Florida White	*Appias drusilla*
Insect	Checkered White	*Pontia protodice*
Insect	Western White	*Pontia occidentalis*
Insect	Cabbage White	*Pieris rapae*
Insect	Great Southern White	*Ascia monuste*
Insect	Giant White	*Ganyra josephina*
Insect	Olympia Marble	*Euchloe olympia*
Insect	Falcate Orangetip	*Anthocharis midea*
Insect	Clouded Sulphur	*Colias philodice*
Insect	Orange Sulphur	*Colias eurytheme*
Insect	Southern Dogface	*Colias cesonia*
Insect	White Angled Sulphur	*Anteos chlorinde*
Insect	Cloudless Sulphur	*Phoebis sennae*
Insect	Orange barred Sulphur	*Phoebis philea*
Insect	Large Orange Sulphur	*Phoebis agarithe*
Insect	Statira Sulphur	*Phoebis statira*
Insect	Lyside Sulphur	*Kricogonia lyside*
Insect	Mexican Yellow	*Eurema mexicana*
Insect	Tailed Orange	*Eurema proterpia*
Insect	Little Yellow	*Eurema lisa*
Insect	Mimosa Yellow	*Eurema nise*
Insect	Sleepy Orange	*Eurema nicippe*
Insect	Dainty Sulphur	*Nathalis iole*
Insect	Harvester	*Feniseca tarquinius*
Insect	American Copper	*Lycaena phlaeas*
Insect	Gray Copper	*Lycaena dione*
Insect	Bronze Copper	*Lycaena hyllus*
Insect	Purplish Copper	*Lycaena helloides*

Appendix 3
Kansas's species that did not meet the Species of Greatest Conservation Need criteria.

Group	Common Name	Scientific Name
Insect	Great Purple Hairstreak	*Atlides halesus*
Insect	Soapberry Hairstreak	*Phaeostrymon alcestis*
Insect	Coral Hairstreak	*Satyrium titus*
Insect	Acadian Hairstreak	*Satyrium acadica*
Insect	Edwards' Hairstreak	*Satyrium edwardsii*
Insect	Banded Hairstreak	*Satyrium calanus*
Insect	Hickory Hairstreak	*Satyrium caryaevorum*
Insect	Striped Hairstreak	*Satyrium liparops*
Insect	Oak Hairstreak	*Satyrium favonius*
Insect	Henry's Elfin	*Callophrys henrici*
Insect	'Olive' Juniper Hairstreak	*Callophrys gryneus gryneus*
Insect	White M Hairstreak	*Parrhasius m album*
Insect	Gray Hairstreak	*Strymon melinus*
Insect	Red banded Hairstreak	*Calycopis cecrops*
Insect	Dusky blue Groundstreak	*Calycopis isobeon*
Insect	Gray Ministreak	*Ministrymon azia*
Insect	Western Pygmy Blue	*Brephidium exile*
Insect	Cassius Blue	*Leptotes cassius*
Insect	Marine Blue	*Leptotes marina*
Insect	Cyna Blue	*Zizula cyna*
Insect	Ceraunus Blue	*Hemiargus ceraunus*
Insect	Reakirt's Blue	*Hemiargus isola*
Insect	Eastern Tailed Blue	*Everes comyntas*
Insect	Spring Azure	*Celastrina ladon*
Insect	Silvery Blue	*Glaucopsyche lygdamus*
Insect	Melissa Blue	*Lycaeides melissa*
Insect	Acmon Blue	*Plebejus acmon*
Insect	American Snout	*Libytheana carinenta*
Insect	Gulf Fritillary	*Agraulis vanillae*
Insect	Banded Orange Heliconian	*Dryadula phaetusa*
Insect	Julia Heliconian	*Dryas iulia*
Insect	Isabella's Heliconian	*Eueides isabella*
Insect	Zebra Heliconian	*Heliconius charithonia*
Insect	Variegated Fritillary	*Euptoieta claudia*
Insect	Great Spangled Fritillary	*Speyeria cybele*
Insect	Aphrodite Fritillary	*Speyeria Aphrodite*
Insect	Edwards' Fritillary	*Speyeria edwardsii*
Insect	Fulvia Checkerspot	*Thessalia fulvia*
Insect	Bordered Patch	*Chlosyne lacinia*
Insect	Gorgone Checkerspot	*Chlosyne gorgone*
Insect	Silvery Checkerspot	*Chlosyne nycteis*
Insect	Texan Crescent	*Phyciodes texana*

Group	Common Name	Scientific Name
Insect	Vesta Crescent	*Phyciodes vesta*
Insect	Phaon Crescent	*Phyciodes phaon*
Insect	Pearl Crescent	*Phyciodes tharos*
Insect	Field Crescent	*Phyciodes campestris*
Insect	Painted Crescent	*Phyciodes picta*
Insect	Baltimore Checkerspot	*Euphydryas phaeton*
Insect	Question Mark	*Polygonia interrogationis*
Insect	Eastern Comma	*Polygonia comma*
Insect	Gray Comma	*Polygonia progne*
Insect	Mourning Cloak	*Nymphalis antiopa*
Insect	Milbert's Tortoiseshell	*Nymphalis milberti*
Insect	American Lady	*Vanessa virginiensis*
Insect	Painted Lady	*Vanessa cardui*
Insect	West Coast Lady	*Vanessa annabella*
Insect	Red Admiral	*Vanessa atalanta*
Insect	Common Buckeye	*Junonia coenia*
Insect	White Peacock	*Anartia jatrophae*
Insect	Malachite	*Siproeta stelenes*
Insect	Red spotted Purple	*Limenitis arthemis astyanax*
Insect	Viceroy	*Limenitis archippus*
Insect	Weidemeyer's Admiral	*Limenitis weidemeyerii*
Insect	California Sister	*Adelpha bredowii*
Insect	Dingy Purplewing	*Eunica monima*
Insect	Florida Purplewing	*Eunica tatila*
Insect	Common Mestra	*Mestra amymone*
Insect	Ruddy Daggerwing	*Marpesia petreus*
Insect	Tropical Leafwing	*Anaea aidea*
Insect	Goatweed Leafwing	*Anaea andria*
Insect	Hackberry Emperor	*Asterocampa celtis*
Insect	Tawny Emperor	*Astrocompass clyton*
Insect	Northern Pearly Eye	*Enodia anthedon*
Insect	Creole Pearly Eye	*Enodia creola*
Insect	Gemmed Satyr	*Cyllopsis gemma*
Insect	Carolina Satyr	*Hermeuptychia sosybius*
Insect	Little Wood Satyr	*Megisto cymela*
Insect	Red Satyr	*Megisto rubricata*
Insect	Common Wood Nymph	*Cercyonis pegala*
Insect	Queen	*Danaus gilippus*
Insect	Silver spotted Skipper	*Epargyreus clarus*
Insect	Long tailed Skipper	*Urbanus proteus*
Insect	Hoary Edge	*Achalarus lyciades*
Insect	Southern Cloudywing	*Thorybes bathyllus*

Appendix 3
Kansas's species that did not meet the Species of Greatest Conservation Need criteria.

Group	Common Name	Scientific Name
Insect	Northern Cloudywing	*Thorybes pylades*
Insect	Confused Cloudywing	*Thorybes confusis*
Insect	Hayhurst's Scallopwing	*Staphylus hayhurstii*
Insect	Sickle winged Skipper	*Achlyodes mithridates*
Insect	Hermit Skipper	*Grais stigmatica*
Insect	White patched Skipper	*Chiomara asychis*
Insect	Sleepy Duskywing	*Erynnis brizo*
Insect	Juvenal's Duskywing	*Erynnis juvenalis*
Insect	Horace's Duskywing	*Erynnis horatius*
Insect	Funeral Duskywing	*Erynnis funeralis*
Insect	Columbine Duskywing	*Erynnis lucilius*
Insect	Wild Indigo Duskywing	*Erynnis baptisiae*
Insect	Afranius Duskywing	*Erynnis afranius*
Insect	Persius Duskywing	*Erynnis persius*
Insect	Common Checkered Skipper	*Pyrgus communis*
Insect	Common Sootywing	*Pholisora catullus*
Insect	Russet Skipperling	*Piruna pirus*
Insect	Swarthy Skipper	*Nastra lherminier*
Insect	*Clouded Skipper	*Lerema accius*
Insect	Least Skipper	*Ancyloxypha numitor*
Insect	Orange Skipperling	*Copaeodes aurantiacus*
Insect	Fiery Skipper	*Hylephila phyleus*
Insect	Uncas Skipper	*Hesperia uncas*
Insect	Leonard's Skipper	*Hesperia leonardus*
Insect	Pahaska Skipper	*Hesperia pahaska*
Insect	Cobweb Skipper	*Hesperia metea*
Insect	Green Skipper	*Hesperia viridis*
Insect	Dotted Skipper	*Hesperia attalus*
Insect	Rhesus Skipper	*Polites rhesus*
Insect	Peck's Skipper	*Polites peckius*
Insect	Tawny edged Skipper	*Polites themistocles*
Insect	Crossline Skipper	*Polites origenes*
Insect	Southern Broken dash	*Wallengrenia otho*
Insect	Northern Broken dash	*Wallengrenia egeremet*
Insect	Little Glassywing	*Pompeius verna*
Insect	Sachem	*Atalopedes campestris*
Insect	Delaware Skipper	*Anatrytone logan*
Insect	Byssus Skipper	*Problema byssus*
Insect	Hobomok Skipper	*Poanes hobomok*
Insect	Zabulon Skipper	*Poanes zabulon*
Insect	Dion Skipper	*Euphyes dion*
Insect	Dun Skipper	*Euphyes vestris*

Group	Common Name	Scientific Name
Insect	Dusted Skipper	*Atrytonopsis hianna*
Insect	Bronze Roadside Skipper	*Amblyscirtes aenus*
Insect	Oslar's Roadside Skipper	*Amblyscirtes oslari*
Insect	Nysa Roadside Skipper	*Amblyscirtes nysa*
Insect	Dotted Roadside Skipper	*Amblyscirtes eos*
Insect	Common Roadside Skipper	*Amblyscirtes vialis*
Insect	Eufala Skipper	*Lerodea eufala*
Insect	Brazilian Skipper	*Calpodes ethlius*
Insect	Yucca Giant Skipper	*Megathymus yuccae*
Insect	Strecker's Giant Skipper	*Megathymus streckeri*
Insect	Iowa Skipper	*Atrytone arogos iowa*
Insect	A Grasshopper	*Trimerotropis saxatilis*
Insect	Eastern Willowfly	*Taeniopteryx burksi*
Insect	Frosted Elfin	*Callophrys irus*
Insect	A Sand-filtering Mayfly	*Homoeoneuria ammophila*
Insect	A Mayfly	*Acentrella insignificans*
Insect	A Mayfly	*Apobaetis indeprensus*
Insect	A Mayfly	*Brachycercus prudens*
Insect	A Mayfly	*Callibaetis pictus*
Insect	A Mayfly	*Eurylophella verisimilis*
Insect	A Pentagenian Burrowing Mayfly	*Pentagenia vittigera*
Insect	A Mayfly	*Pseudocloeon longipalpus*
Insect	A Mayfly	*Raptoheptagenia cruentata*
Insect	A Mayfly	*Siphlonurus occidentalis*
Insect	A Spring Stonefly	*Hydroperia fugitans*
Insect	Ebony Jewelwing	*Calopteryx maculata*
Insect	American Rubyspot	*Hetaerina americana*
Insect	Smoky Rubyspot	*Hetaerina titia*
Insect	Great Spreadwing	*Archilestes grandis*
Insect	Common Spreadwing	*Lestes disjunctus australis*
Insect	Amber winged Spreadwing	*Lestes eurinus*
Insect	Slender Spreadwing	*Lestes rectangularis*
Insect	Lyre tipped Spreadwing	*Lestes unguiculatus*
Insect	Red Damsel	*Amphiagrion sp.*
Insect	Paiute Dancer	*Argia alberta*
Insect	Blue fronted Dancer	*Argia apicalis*
Insect	Seepage Dancer	*Argia bipunctulata*
Insect	Variable Dancer	*Argia fumipennis violacea*
Insect	Kiowa Dancer	*Argia immunda*
Insect	Powdered Dancer	*Argia moesta*
Insect	Aztec Dancer	*Argia nahuana*

Appendix 3
Kansas's species that did not meet the Species of Greatest Conservation Need criteria.

Group	Common Name	Scientific Name
Insect	Springwater Dancer	*Argia plana*
Insect	Blue ringed Dancer	*Argia sedula*
Insect	Blue tipped Dancer	*Argia tibialis*
Insect	Dusky Dancer	*Argia translata*
Insect	Rainbow Bluet	*Enallagma antennatum*
Insect	Azure Bluet	*Enallagma aspersum*
Insect	Double striped Bluet	*Enallagma basidens*
Insect	Tule Bluet	*Enallagma carunculatum*
Insect	Familiar Bluet	*Enallagma civile*
Insect	Turquoise Bluet	*Enallagma divagans*
Insect	Stream Bluet	*Enallagma exsulans*
Insect	Skimming Bluet	*Enallagma geminatum*
Insect	Arroyo Bluet	*Enallagma praevarum*
Insect	Orange Bluet	*Enallagma signatum*
Insect	Slender Bluet	*Enallagma traviatum westfalli*
Insect	Vesper Bluet	*Enallagma vesperum*
Insect	Desert Forktail	*Ischnura barberi*
Insect	Plains Forktail	*Ischnura damula*
Insect	Mexican Forktail	*Ischnura demorsa*
Insect	Black fronted Forktail	*Ischnura denticollis*
Insect	Citrine Forktail	*Ischnura hastata*
Insect	Western Forktail	*Ischnura perparva*
Insect	Fragile Forktail	*Ischnura posita*
Insect	Eastern Forktail	*Ischnura verticalis*
Insect	Sphagnum Sprite	*Nehalennia gracilis*
Insect	Desert Firetail	*Telebasis salva*
Insect	Lance tipped Darner	*Aeshna constricta*
Insect	Variable Darner	*Aeshna interrupta lineata*
Insect	Blue eyed Darner	*Aeshna multicolor*
Insect	Shadow Darner	*Aeshna umbrosa*
Insect	Common Green Darner	*Anax junius*
Insect	Comet Darner	*Anax longipes*
Insect	Springtime Darner	*Basiaeshchna janata*
Insect	Fawn Darner	*Boyeria vinosa*
Insect	Swamp Darner	*Epiaeschna heros*
Insect	Cyrano Darner	*Nasiaeschna pentacantha*
Insect	Stillwater Clubtail	*Arigomphus lentulus*
Insect	Jade Clubtail	*Arigomphus submedianus*
Insect	Black shouldered Spinyleg	*Dromogomphus spinosus*
Insect	Flag tailed Spinyleg	*Dromogomphus spoliatus*
Insect	Eastern Ringtail	*Erpetogomphus designatus*

Group	Common Name	Scientific Name
Insect	Plains Clubtail	*Gomphus (Gomphurus) externus*
Insect	Ozark Clubtail	*Gomphus (Gomphurus) ozarkensis*
Insect	Cobra Clubtail	*Gomphus (Gomphurus) vastus*
Insect	Pronghorn Clubtail	*Gomphus (Gomphus) graslinellus*
Insect	Sulpher tipped Clubtail	*Gomphus (Gomphus) militaris*
Insect	Dragonhunter	*Hagenius brevistylus*
Insect	Rusty Snaketail	*Ophiogomphus rupinsulensis*
Insect	Pale Snaketail	*Ophiogomphus severus*
Insect	Common Sanddragon	*Progomphus obscurus*
Insect	Least Clubtail	*Stylogomphus albistylus*
Insect	Riverine Clubtail	*Stylurus amnicola*
Insect	Brimstone Clubtail	*Stylurus intricatus*
Insect	Russett tipped Clubtail	*Stylurus plagiatus*
Insect	Arrowhead Spiketail	*Cordulegaster obliqua*
Insect	Stream Cruiser	*Didymops transversa*
Insect	Illinois River Cruiser	*Macromia illinoiensis*
Insect	Gilded River Cruiser	*Macromia pacifica*
Insect	Royal River Cruiser	*Macromia taeniolata*
Insect	Stripe winged Baskettail	*Epitheca (Tetragoneuria) costalis*
Insect	Common Baskettail	*Epitheca (Tetragoneuria) cynosura*
Insect	Dot winged Baskettail	*Epitheca (Tetragoneuria) petechialis*
Insect	Prince Baskettail	*Epitheca (Epicordulia) princeps*
Insect	Smoky Shadowdragon	*Neurocordulia molesta*
Insect	Orange Shadowdragon	*Neurocordulia xanthosoma*
Insect	Mocha Emerald	*Somatochlora linearis*
Insect	Clamp-tipped Emerald	*Somatochlora tenebrosa*
Insect	Pale faced Clubskimmer	*Brechmorhoga mendax*
Insect	Calico Pennant	*Celithemis elisa*
Insect	Halloween Pennant	*Celithemis eponina*
Insect	Banded Pennant	*Celithemis fasciata*
Insect	Double ringed Pennant	*Celithemis verna*
Insect	Checkered Setwing	*Dythemis fugax*
Insect	Swift Setwing	*Dythemis velox*
Insect	Eastern Pondhawk	*Erythemis simplicicollis*
Insect	Great Pondhawk	*Erythemis vesiculosa*
Insect	Band winged Dragonlet	*Erythrodiplax umbrata*
Insect	Blue Corporal	*Ladona deplanata*
Insect	Dot tailed Whiteface	*Leucorrhinia intacta*
Insect	Comanche Skimmer	*Libellula comanche*

Appendix 3
Kansas's species that did not meet the Species of Greatest Conservation Need criteria.

Group	Common Name	Scientific Name
Insect	Spangled Skimmer	*Libellula cyanea*
Insect	Yellow sided Skimmer	*Libellula flavida*
Insect	Slaty Skimmer	*Libellula incesta*
Insect	Widow Skimmer	*Libellula luctuosa*
Insect	Twelve spotted Skimmer	*Libellula pulchella*
Insect	Flame Skimmer	*Libellula saturata*
Insect	Painted Skimmer	*Libellula semifasciata*
Insect	Great Blue Skimmer	*Libellula vibrans*
Insect	Roseate Skimmer	*Orthemis ferruginea*
Insect	Blue Dasher	*Pachydiplax longipennis*
Insect	Wandering Glider	*Pantala flavescens*
Insect	Spot winged Glider	*Pantala hymenaea*
Insect	Eastern Amberwing	*Perithemis tenera*
Insect	Common Whitetail	*Plathemis lydia*
Insect	Desert Whitetail	*Plathemis subornata*
Insect	Blue faced Meadowhawk	*Sympetrum ambiguum*
Insect	Variegated Meadowhawk	*Sympetrum corruptum*
Insect	Saffron winged Meadowhawk	*Sympetrum costiferum*
Insect	Cherry faced Meadowhawk	*Sympetrum internum*
Insect	White-faced Meadowhawk	*Sympetrum obtrusum*
Insect	Western Meadowhawk	*Sympetrum occidentale fasciatum*
Insect	Ruby Meadowhawk	*Sympetrum rubicundulum*
Insect	Yellow-legged Meadowhawk	*Sympetrum vicinum*
Insect	Carolina Saddlebags	*Tramea carolina*
Insect	Black Saddlebags	*Tramea lacerata*
Insect	Red mantled Saddlebags	*Tramea onusta*
Insect	Corydalus cornutus	*Corydalus cornutus*
Insect	Chauliodes pectinicornis	*Chauliodes pectinicornis*
Insect	Chauliodes rastricornis	*Chauliodes rastricornis*
Insect	Neohermes concolor	*Neohermes concolor*
Insect	Nigronia serricornis	*Nigronia serricornis*
Insect	Sialis infumata	*Sialis infumata*
Insect	Sialis itasca	*Sialis itasca*
Insect	Sialis mohri	*Sialis mohri*
Insect	Sialis vagans	*Sialis vagans*
Insect	Sialis velata	*Sialis velata*
Insect	Ascaloptynx Appendiculatus	*Ascaloptynx Appendiculatus*
Insect	Uluodes macleayana	*Uluodes macleayana*
Insect	Uluodes quadripunctatus	*Uluodes quadripunctatus*
Insect	Lomamyia banksi	*Lomamyia banksi*
Insect	Lomamyia flavicornis	*Lomamyia flavicornis*
Insect	Leucochrysa americana	*Leucochrysa americana*
Insect	Ceraeochrysa lineaticornis	*Ceraeochrysa lineaticornis*
Insect	Chrysopa nigricornis	*Chrysopa nigricornis*
Insect	Chrysopa oculata	*Chrysopa oculata*
Insect	Chrysopa quadripunctata	*Chrysopa quadripunctata*
Insect	Chrysoperla harrisii	*Chrysoperla harrisii*
Insect	Chrysoperla plurabunda	*Chrysoperla plurabunda*
Insect	Chrysoperla rufilabris	*Chrysoperla rufilabris*
Insect	Eremochrysa sabulosa	*Eremochrysa sabulosa*
Insect	Eremochrysa fraterna	*Eremochrysa fraterna*
Insect	Eremochrysa punctinervis	*Eremochrysa punctinervis*
Insect	Meleoma arizonensis	*Meleoma arizonensis*
Insect	Pseudomallada macleodi	*Pseudomallada macleodi*
Insect	Pseudomallada perfectus	*Pseudomallada perfectus*
Insect	Coniopteryx fitchi	*Coniopteryx fitchi*
Insect	Coniopteryx westwoodi	*Coniopteryx westwoodi*
Insect	Semidalis vicina	*Semidalis vicina*
Insect	Hemerobius conjunctus	*Hemerobius conjunctus*
Insect	Hemerobius humulinus	*Hemerobius humulinus*
Insect	Hemerobius stigma	*Hemerobius stigma*
Insect	Micromus posticus	*Micromus posticus*
Insect	Micromus subanticus	*Micromus subanticus*
Insect	Micromus variolosus	*Micromus variolosus*
Insect	Sympherobius amiculus	*Sympherobius amiculus*
Insect	Sympherobius barberi	*Sympherobius barberi*
Insect	Sympherobius occidentalis	*Sympherobius occidentalis*
Insect	Sympherobius perparvus	*Sympherobius perparvus*
Insect	Climaciella brunnea	*Climaciella brunnea*
Insect	Mantispa interrupta	*Mantispa interrupta*
Insect	Mantispa sayi	*Mantispa sayi*
Insect	Dendroleon obsoletus	*Dendroleon obsoletus*
Insect	Psammoleon guttipes	*Psammoleon guttipes*
Insect	Brachynemurus abdominalis	*Brachynemurus abdominalis*
Insect	Brachynemurus blandus	*Brachynemurus blandus*
Insect	Brachynemurus hubbardi	*Brachynemurus hubbardi*
Insect	Brachynemurus irregularis	*Brachynemurus irregularis*
Insect	Brachynemurus mexicanus	*Brachynemurus mexicanus*

Appendix 3
Kansas's species that did not meet the Species of Greatest Conservation Need criteria.

Group	Common Name	Scientific Name
Insect	Brachynemurus nebulosus	*Brachynemurus nebulosus*
Insect	Brachynemurus sackeni	*Brachynemurus sackeni*
Insect	Brachynemurus signatus	*Brachynemurus signatus*
Insect	Clathroneuria coquilletti	*Clathroneuria coquilletti*
Insect	Scotoleon carrizonus	*Scotoleon carrizonus*
Insect	Scotoleon minusculus	*Scotoleon minusculus*
Insect	Scotoleon nigrilabris	*Scotoleon nigrilabris*
Insect	Myrmeleon immaculatus	*Myrmeleon immaculatus*
Insect	Myrmeleon rusticus	*Myrmeleon rusticus*
Insect	Polystoechotes punctatus	*Polystoechotes punctatus*
Insect	Climacia areolaris	*Climacia areolaris*
Insect	Sisyra vicaria	*Sisyra vicaria*
Insect	Aegialia conferta	*Aegialia conferta*
Insect	Aegialia rufa	*Aegialia rufa*
Insect	Aegialia rufina	*Aegialia rufina*
Insect	Aphodius badipes	*Aphodius badipes*
Insect	Aphodius concavus	*Aphodius concavus*
Insect	Aphodius fossor	*Aphodius fossor*
Insect	Aphodius haemorrhoidalis	*Aphodius haemorrhoidalis*
Insect	Aphodius iowensis	*Aphodius iowensis*
Insect	Aphodius knausi	*Aphodius knausi*
Insect	Aphodius lentus	*Aphodius lentus*
Insect	Aphodius leptotarsus	*Aphodius leptotarsus*
Insect	Aphodius russeus	*Aphodius russeus*
Insect	Aphodius scabriceps	*Aphodius scabriceps*
Insect	Aphodius serval	*Aphodius serval*
Insect	Aphodius stercorosus	*Aphodius stercorosus*
Insect	Aphodius terminalis	*Aphodius terminalis*
Insect	Aphodius testaceiventrus	*Aphodius testaceiventrus*
Insect	Aphodius walshi	*Aphodius walshi*
Insect	Psammodius mimeticus	*Psammodius mimeticus*
Insect	Psammodius interruptus	*Psammodius interruptus*
Insect	Ataenius apicalis	*Ataenius apicalis*
Insect	Ataenius hesperius	*Ataenius hesperius*
Insect	Ataenius puncifrons	*Ataenius puncifrons*
Insect	Ataenius robustus	*Ataenius robustus*
Insect	Geotrupes opacus	*Geotrupes opacus*
Insect	Boreocanthon probus	*Boreocanthon probus*
Insect	Canthon chalcites	*Canthon chalcites*
Insect	Canthon ebenus	*Canthon ebenus*
Insect	Canthon pilularius	*Canthon pilularius*

Group	Common Name	Scientific Name
Insect	Canthon viridis	*Canthon viridis*
Insect	Melanocanthon nigricornis	*Melanocanthon nigricornis*
Insect	Copris fricator	*Copris fricator*
Insect	Copris minutus	*Copris minutus*
Insect	Dichotomius carolinus	*Dichotomius carolinus*
Insect	Dichotomius difformis	*Dichotomius difformis*
Insect	Dichotomius vindex	*Dichotomius vindex*
Insect	Onthophagus gazella	*Onthophagus gazella*
Insect	Onthophagus hecate	*Onthophagus hecate*
Insect	Onthophagus knausi	*Onthophagus knausi*
Insect	Onthophagus oklhaomensis	*Onthophagus oklhaomensis*
Insect	Onthophagus orpheus pseudorpheus	*Onthophagus orpheus pseudorpheus*
Insect	Onthophagus pennsylvanicus	*Onthophagus pennsylvanicus*
Insect	Onthophagus striatulus	*Onthophagus striatulus*
Insect	Onthophagus tuberculifrons	*Onthophagus tuberculifrons*
Insect	Asilus sericeus	*Asilus sericeus*
Insect	Atomosia puella	*Atomosia puella*
Insect	Atomosia punctifera	*Atomosia punctifera*
Insect	Atomosia pusilla	*Atomosia pusilla*
Insect	Atomosia rufipes	*Atomosia rufipes*
Insect	Atomosia sayii	*Atomosia sayii*
Insect	Beameromyia kawiensis	*Beameromyia kawiensis*
Insect	Beameromyia pictipes	*Beameromyia pictipes*
Insect	Beameromyia prairiensis	*Beameromyia prairiensis*
Insect	Ceraturgus cruciatus	*Ceraturgus cruciatus*
Insect	Cerotainia macrocera	*Cerotainia macrocera*
Insect	Cerotainiops abdominalis	*Cerotainiops abdominalis*
Insect	Cophura stylosa	*Cophura stylosa*
Insect	Cyrtopogon profusus	*Cyrtopogon profusus*
Insect	Dasylechia atrox	*Dasylechia atrox*
Insect	Dicropaltum mesae	*Dicropaltum mesae*
Insect	Dicropaltum pawneeae	*Dicropaltum pawneeae*
Insect	Dicropaltum rubicundus	*Dicropaltum rubicundus*
Insect	Diogmites angustipennis	*Diogmites angustipennis*
Insect	Diogmites misellus	*Diogmites misellus*
Insect	Diogmites neoternatus	*Diogmites neoternatus*
Insect	Diogmites platypterus	*Diogmites platypterus*
Insect	Diogmites symmachus	*Diogmites symmachus*
Insect	Diogmites ternatus	*Diogmites ternatus*
Insect	Ecthodopa pubera	*Ecthodopa pubera*
Insect	Efferia aestuans	*Efferia aestuans*

Appendix 3
Kansas's species that did not meet the Species of Greatest Conservation Need criteria.

Group	Common Name	Scientific Name
Insect	Efferia albibarbis	*Efferia albibarbis*
Insect	Efferia anomala	*Efferia anomala*
Insect	Efferia argentifrons	*Efferia argentifrons*
Insect	Efferia argyrosoma	*Efferia argyrosoma*
Insect	Efferia aurimystacea	*Efferia aurimystacea*
Insect	Efferia candida	*Efferia candida*
Insect	Efferia helenae	*Efferia helenae*
Insect	Efferia kansensis	*Efferia kansensis*
Insect	Efferia leucocoma	*Efferia leucocoma*
Insect	Efferia luna	*Efferia luna*
Insect	Efferia nemoralis	*Efferia nemoralis*
Insect	Efferia pallidula	*Efferia pallidula*
Insect	Efferia plena	*Efferia plena*
Insect	Efferia pogonias	*Efferia pogonias*
Insect	Efferia prairiensis	*Efferia prairiensis*
Insect	Efferia rapax	*Efferia rapax*
Insect	Efferia snowi	*Efferia snowi*
Insect	Efferia staminea	*Efferia staminea*
Insect	Efferia texana	*Efferia texana*
Insect	Efferia varipes	*Efferia varipes*
Insect	Heteropogon phoenicurus	*Heteropogon phoenicurus*
Insect	Hodophylax aridus	*Hodophylax aridus*
Insect	Holcocephala abdominalis	*Holcocephala abdominalis*
Insect	Holcocephala calva	*Holcocephala calva*
Insect	Holopogon snowi	*Holopogon snowi*
Insect	Lampria bicolor	*Lampria bicolor*
Insect	Lampria rubiventris	*Lampria rubiventris*
Insect	Laphria canis	*Laphria canis*
Insect	Laphria grossa	*Laphria grossa*
Insect	Laphria lata	*Laphria lata*
Insect	Laphria sicula	*Laphria sicula*
Insect	Laphria thoracica	*Laphria thoracica*
Insect	Laphria vorax	*Laphria vorax*
Insect	Laphystia ertebrate	*Laphystia ertebrate*
Insect	Laphystia flavipes	*Laphystia flavipes*
Insect	Laphystia notata	*Laphystia notata*
Insect	Laphystia sexfasciata	*Laphystia sexfasciata*
Insect	Laphystia snowi	*Laphystia snowi*
Insect	Laphystia varipes	*Laphystia varipes*
Insect	Leptogaster brevicornis	*Leptogaster brevicornis*
Insect	Leptogaste rcoloradensis	*Leptogaste rcoloradensis*
Insect	Leptogaster flavipes	*Leptogaster flavipes*

Group	Common Name	Scientific Name
Insect	Leptogaster incisuralis	*Leptogaster incisuralis*
Insect	Leptogaster murina	*Leptogaster murina*
Insect	Leptogaster panda	*Leptogaster panda*
Insect	Machimus antimachus	*Machimus antimachus*
Insect	Machimus delusus	*Machimus delusus*
Insect	Machimus erythocnemius	*Machimus erythocnemius*
Insect	Machimus formosus	*Machimus formosus*
Insect	Machimus notatus	*Machimus notatus*
Insect	Machimus prairiensis	*Machimus prairiensis*
Insect	Machimus snowii	*Machimus snowii*
Insect	Mallophora orcina	*Mallophora orcina*
Insect	Megaphorus acrus	*Megaphorus acrus*
Insect	Megaphorus guildiana	*Megaphorus guildiana*
Insect	Microstylum galactodes	*Microstylum galactodes*
Insect	Microstylum morosum	*Microstylum morosum*
Insect	Ommatius gemma	*Ommatius gemma*
Insect	Ommatius oklahomensis	*Ommatius oklahomensis*
Insect	Ommatius ouchitensis	*Ommatius ouchitensis*
Insect	Ospriocerus abdominalis	*Ospriocerus abdominalis*
Insect	Ospriocerus aeacidinus	*Ospriocerus aeacidinus*
Insect	Ospriocerus latipennis	*Ospriocerus latipennis*
Insect	Ospriocerus pumilis	*Ospriocerus pumilis*
Insect	Ospriocerus rhadamanthus	*Ospriocerus rhadamanthus*
Insect	Philonicus rufipennis	*Philonicus rufipennis*
Insect	Proctacanthella cacopiloga	*Proctacanthella cacopiloga*
Insect	Proctacanthella leucopogon	*Proctacanthella leucopogon*
Insect	Proctacanthus brevipennis	*Proctacanthus brevipennis*
Insect	Proctacanthus duryi	*Proctacanthus duryi*
Insect	Proctacanthus hinei	*Proctacanthus hinei*
Insect	Proctacanthus micans	*Proctacanthus micans*
Insect	Proctacanthus milbertii	*Proctacanthus milbertii*
Insect	Proctacanthus nearno	*Proctacanthus nearno*
Insect	Proctacanthus rodecki	*Proctacanthus rodecki*
Insect	Proctacanthus rufus	*Proctacanthus rufus*
Insect	Promachus albifacies	*Promachus albifacies*
Insect	Promachus bastardii	*Promachus bastardii*
Insect	Promachus dimidiatus	*Promachus dimidiatus*
Insect	Promachus fitchii	*Promachus fitchii*
Insect	Promachus hinei	*Promachus hinei*
Insect	Promachus oklahomensis	*Promachus oklahomensis*
Insect	Promachus ertebrates	*Promachus ertebrates*

Appendix 3
Kansas's species that did not meet the Species of Greatest Conservation Need criteria.

Group	Common Name	Scientific Name
Insect	Psilocurus modestus	*Psilocurus modestus*
Insect	Sarapogon combustus	*Sarapogon combustus*
Insect	Scleropogon helvolus	*Scleropogon helvolus*
Insect	Scleropogon picticornis	*Scleropogon picticornis*
Insect	Scleropogon sublatus	*Scleropogon sublatus*
Insect	Stenopogon martini	*Stenopogon martini*
Insect	Stichopogon argenteus	*Stichopogon argenteus*
Insect	Stichopogon pritchardi	*Stichopogon pritchardi*

Group	Common Name	Scientific Name
Insect	Stichopogon trifasciatus	*Stichopogon trifasciatus*
Insect	Taracticus octopunctatus	*Taracticus octopunctatus*
Insect	Tipulogaster glabrata	*Tipulogaster glabrata*
Insect	Triorla interrupta	*Triorla interrupta*
Insect	Zabrops flavipilis	*Zabrops flavipilis*
Insect	American Salmonfly	*Pteronarcys dorsata*
Insect	Midwestern Salmonfly	*Pteronarcys pictetii*

Group	Common Name	Scientific Name
Gastropods	Creeping Ancylid	*Ferrissia rivularis*
Gastropods	Dusky Fossaria	*Fossaria dalli*
Gastropods	Golden Fossaria	*Fossaria obrussa*
Gastropods	Fossaria techella	*Fossaria techella*
Gastropods	Ash Gyro	*Gyraulus parvus*
Gastropods	Two-ridge Rams-horn	*Helisoma anceps*
Gastropods	Dusky Ancylid	*Laevapex fuscus*

Gastropods	Tadpole Physa	*Physella gyrina*
Gastropods	Pewter Physa	*Physella heterostropha*
Gastropods	Protean Physa	*Physella virgata*
Gastropods	Sharp Sprite	*Promenetus exacuous*
Gastropods	Umbilicate Sprite	*Promenetus umbilicatellus*
Gastropods	Mimic Lymnaea	*Pseudosuccinea columella*
Gastropods	Flat-whorled Pondsnail	*Stagnicola exilis*
Gastropods	Mottled Fingernailclam	*Eupera cubensis*

Group	Common Name	Scientific Name
Amphipod	Kansas Well Amhipod	*Bactrurus hubrichti*
Amphipod	A Cave Obligate Amphipod	*Stygobromus alabamensis*
Amphipod	Onondaga Cave Amphipod	*Sygobromus onondagaensis*

Group	Common Name	Scientific Name
Crustaceans	Versitle Fairy Shrimp	*Branchinecta lindahli*
Crustaceans	Rock Pool Fairy Shrimp	*Branchinecta packardi*
Crustaceans	Ethologist Fairy Shrimp	*Eubranchipus serratus*
Crustaceans	Spinytail Fairy Shrimp	*Streptocephalus sealii*
Crustaceans	Greater Plains Fairy Shrimp	*Streptocephalus texanus*
Crustaceans	Beavertail Fairy Shrimp	*Thamnocephalus platyurus*

Group	Common Name	Scientific Name
Crustaceans	Longtail Tadpole Shrimp	*Triops longicaudatus*
Crustaceans	Desert Tadpole Shrimp	*Triops newberryi*
Crustaceans	Great Plains Clam Shrimp	*Cyzicus belfragei*
Crustaceans	Mexican Clam Shrimp	*Cyzicus mexicanus*
Crustaceans	Texan Clam Shrimp	*Eulimnadia texana*
Crustaceans	Short Finger Clam Shrimp	*Lynceus brevifrons*
Crustaceans	White River Crayfish (X)	*Procambarus acutus*

Group	Common Name	Scientific Name
Mussels	Mucket	*Actinonaias ligamentina*
Mussels	Purple Wartyback	*Cyclonaias tuberculata*
Mussels	Pocketbook	*Lampsilis ovata*
Mussels	Threehorn Wartyback	*Obliquaria reflexa*
Mussels	Pink Heelsplitter	*Potamilus alatus*

Group	Common Name	Scientific Name
Mussels	Fat Pocketbook ?	*Potamilus capax*
Mussels	Pink Papershell	*Potamilus ohiensis*
Mussels	Giant Floater	*Pyganodon grandis*
Mussels	Lilliput	*Toxolasma parvus*
Mussels	Paper Pondshell	*Utterbackia imbecillis*

Appendix 3
Kansas's species that did not meet the Species of Greatest Conservation Need criteria.

Group	Common Name	Scientific Name
Birds	Yellow-billed Loon	*Gavia adamsii*
Birds	Common Loon	*Gavia immer*
Birds	Pacific Loon	*Gavia pacifica*
Birds	Red-throated Loon	*Gavia stellata*
Birds	Clark's Grebe	*Aechmophorus clarkii*
Birds	Horned Grebe	*Podiceps auritus*
Birds	Red-Necked Grebe	*Podiceps grisegena*
Birds	Lapland Longspur	*Calcarius lapponicus*
Birds	Pied-billed Grebe	*Podilymbus podiceps*
Birds	Brown Pelican	*Pelecanus occidentalis*
Birds	Double-crested Cormorant	*Phalacrocroax auritus*
Birds	Neoptropic Cormorant	*Phalacrocroax brasilianus*
Birds	Anhinga	*Anhinga anhinga*
Birds	Magnificent Frigatebird	*Fregata magnificens*
Birds	Great Blue Heron	*Ardea herodias*
Birds	Cattle Egret	*Bubulcus ibis*
Birds	Green Heron	*Butorides virescens*
Birds	Reddish egret	*Egretta rufescens*
Birds	Tricolored Heron	*Egretta tricolor*
Birds	Yellow-crowned Night-Heron	*Nyctanassa violacea*
Birds	Roseate Spoonbill	*Ajaia ajaja*
Birds	White Ibis	*Eudocimus albus*
Birds	White-faced Ibis (T)	*Plegadis chihi*
Birds	Glossy Ibis	*Plegadis falcinellus*
Birds	Wood Stork	*Mycteria americana*
Birds	Turkey Vulture	*Cathartes aura*
Birds	Black Vulture	*Coragyps atratus*
Birds	Greater Flamingo	*Phoenicopterus ruber*
Birds	Wood Duck	*Aix sponsa*
Birds	American Wigeon	*Anas americana*
Birds	Northern Shoveler	*Anas clypeata*
Birds	Green-winged Teal	*Anas crecca*
Birds	Cinnamon Teal	*Anas cyanoptera*
Birds	Blue-winged Teal	*Anas discors*
Birds	Mottled Duck	*Anas fulvigula*
Birds	Eurasian Wigeon	*Anas penelope*
Birds	Mallard	*Anas platyrhynchos*
Birds	Garganey	*Anas querquedula*
Birds	American Black Duck	*Anas rubripes*
Birds	Gadwall	*Anas strepera*

Group	Common Name	Scientific Name
Birds	Greater White-fronted Goose	*Anser albifrons*
Birds	Lesser Scaup	*Aythya affinis*
Birds	Redhead	*Aythya americana*
Birds	Ring-necked Duck	*Aythya collaris*
Birds	Tufted Duck	*Aythya fuligula*
Birds	Greater Scaup	*Aythya marila*
Birds	Brant	*Branta bernicla*
Birds	Bufflehead	*Bucephala albeola*
Birds	Common Goldeneye	*Bucephala clangula*
Birds	Barrow's Goldeneye	*Bucephala islandica*
Birds	Canada Goose	*Branta canadensis*
Birds	Snow/Blue Goose	*Chen caerulescens*
Birds	Ross's Goose	*Chen rossii*
Birds	Long-tailed duck	*Clangula hyemalis*
Birds	Trumpeter Swan	*Cygnus buccinator*
Birds	Tundra Swan	*Cygnus columbianus*
Birds	Black-bellied Whistling-duck	*Dendrocygna autumnalis*
Birds	Fulvous Whistling-duck	*Dendrocygna bicolor*
Birds	Hooded Merganser	*Lophodytes cucullatus*
Birds	White-winged Scoter	*Melanitta fusca*
Birds	Black Scoter	*Melanitta nigra*
Birds	Surf Scoter	*Melanitta perspicillata*
Birds	Common Merganser	*Mergus merganser*
Birds	Red-breasted Merganser	*Mergus serrator*
Birds	Ruddy Duck	*Oxyura jamaicensis*
Birds	Common Eider	*Somateria mollissima*
Birds	King Eider	*Somateria spectabilis*
Birds	Harlequin Duck	*Histrionicus histrionicus*
Birds	Cooper's Hawk	*Accipiter cooperii*
Birds	Northern Goshawk	*Accipiter gentilis*
Birds	Gray Hawk	*Asturina nitida*
Birds	Sharp-skinned Hawk	*Accipiter striatus*
Birds	Red-tailed Hawk	*Buteo jamaicensis*
Birds	Rough-legged Hawk	*Buteo lagopus*
Birds	Red-shouldered Hawk	*Buteo lineatus*
Birds	Broad-winged Hawk	*Buteo platypterus*
Birds	Northern Harrier	*Circus cyaneus*
Birds	White-tailed Kite	*Elanus leucurus*
Birds	Osprey	*Pandion haliaetus*
Birds	Harris's Hawk	*Parabuteo unicinctus*
Birds	Merlin	*Falco columbarius*

Appendix 3
Kansas's species that did not meet the Species of Greatest Conservation Need criteria.

Group	Common Name	Scientific Name
Birds	Prairie Falcon	*Falco mexicanus*
Birds	Gyrfalcon	*Falco rusticolus*
Birds	American Kestrel	*Falco sparverius*
Birds	Ruffed Grouse	*Bonasa umbellus*
Birds	Sage Grouse (X)	*Centrocerus urophasianus*
Birds	Wild Turkey	*Meleagris gallopavo*
Birds	Ring-necked Pheasant	*Phasianus colchicus**
Birds	Sharp-tailed Grouse	*Tympanuchus phasianellus*
Birds	Yellow Rail	*Coturnicops noveboracensis*
Birds	American Coot	*Fulica americana*
Birds	Common Moorhen	*Gallinula chloropus*
Birds	Purple Gallinule	*Porhyrula martinica*
Birds	Sora	*Porzana carolina*
Birds	King Rail	*Rallus elegans*
Birds	Virginia Rail	*Rallus limicola*
Birds	Sandhill Crane	*Grus canadensis*
Birds	Semipalmated Plover	*Charadrius semipalmatus*
Birds	Killdeer	*Charadrius vociferus*
Birds	Wilson's Plover	*Charadrius wilsonia*
Birds	Spotted Sandpiper	*Actitis macularia*
Birds	Ruddy Turnstone	*Arenaria interpres*
Birds	Sanderling	*Calidris alba*
Birds	Dunlin	*Calidris alpina*
Birds	Red Knot	*Calidris canutus*
Birds	Curlew Sandpiper	*Calidris ferruginea*
Birds	Western Sandpiper	*Calidris mauri*
Birds	Willet	*Catoptrophorus semipalmatus*
Birds	Common Snipe	*Gallinago gallinago*
Birds	Short-billed Dowitcher	*Limnodromus griseus*
Birds	Whimbrel	*Numenius phaeopus*
Birds	Red Phalarope	*Phalaropus fulicaria*
Birds	Red-necked Phalarope	*Phalaropus lobatus*
Birds	Ruff	*Philomachus Pugnax*
Birds	American Woodcock	*Scolopax minor*
Birds	Spotted Redshank	*Tringa erythropus*
Birds	Solitary Sandpiper	*Tringa solitaria*
Birds	Herring Gull	*Larus argentatus*
Birds	Laughing Gull	*Larus atricilla*
Birds	California Gull	*Larus californicus*
Birds	Mew Gull	*Larus canus*
Birds	Ring-billed Gull	*Larus delawarensis*
Birds	Lesser Black-backed Gull	*Larus fuscus*

Group	Common Name	Scientific Name
Birds	Glaucous-winged Gull	*Larus glaucescens*
Birds	Iceland Gull	*Larus glaucoides*
Birds	Glaucous Gull	*Larus hyperboreus*
Birds	Great Black-backed Gull	*Larus marinus*
Birds	Little Gull	*Larus minutus*
Birds	Bonaparte's Gull	*Larus philadelphia*
Birds	Franklin's Gull	*Larus pipixcan*
Birds	Black-headed Gull	*Larus ridibundus*
Birds	Thayer's Gull	*Larus thayeri*
Birds	Black-legged Kittiwake	*Rissa tridactyla*
Birds	Black Skimmer	*Rynchops niger*
Birds	Long-tailed Jaeger	*Stercorarius longicaudus*
Birds	Parasitic Jaeger	*Stercorarius parasiticus*
Birds	Pomarine Jaeger	*Stercorarius pomarinus*
Birds	Caspian Tern	*Sterna caspia*
Birds	Common Tern	*Sterna hirundo*
Birds	Gull-billed Tern	*Sterna nilotica*
Birds	Arctic Tern	*Sterna paradisaea*
Birds	Sabine's Gull	*Xema sabini*
Birds	Long-billed Murrelet	*Brachyramphus perdix*
Birds	Band-tailed Pigeon	*Columba fasciata*
Birds	Rock Dove (Feral Pigeon)	*Columba livia**
Birds	Inca Dove	*Columbina inca*
Birds	Common Ground-Dove	*Columbina passerina*
Birds	Passenger Pigeon (X)	*Ectopistes migratorius*
Birds	Eurasian Collared-Dove	*Streptopelia decaocto**
Birds	White-winged Dove	*Zenaida asiatica*
Birds	Mourning Dove	*Zenaida macroura*
Birds	Carolina Parakeet (X)	*Conuropsis carolinensis*
Birds	Yellow-billed Cuckoo	*Coccyzus americanus*
Birds	Groove-billed Ani	*Crotophaga sulcirostris*
Birds	Greater Roadrunner	*Geococcyx californianus*
Birds	Northern Saw-whet Owl	*Aegolius acadicus*
Birds	Long-eared Owl	*Asio otus*
Birds	Great Horned Owl	*Bubo virginianus*
Birds	Snowy Owl	*Nyctea scandiaca*
Birds	Eastern Screech-owl	*Otus asio*
Birds	Western Screech-owl	*Otus kennicotti*
Birds	Barred Owl	*Strix varia*
Birds	Flammulated Owl	*Otus flammeolus*
Birds	Lesser Nighthawk	*Chordeiles acutipennis*
Birds	White-throated Swift	*Aeronautes saxatalis*

Appendix 3
Kansas's species that did not meet the Species of Greatest Conservation Need criteria.

Group	Common Name	Scientific Name
Birds	Chimney Swift	*Chaetura pelagica*
Birds	Black-chinned Hummingbird	*Archilochus alexandri*
Birds	Ruby-throated Hummingbird	*Archilochus colubris*
Birds	Anna's Hummingbird	*Calypte anna*
Birds	Costa's Hummingbird	*Caplypte costae*
Birds	Magnificent Hummingbird	*Eugenes fulgens*
Birds	Broad-tailed Hummingbird	*Selasphorus platycercus*
Birds	Rufous Hummingbird	*Selasphorus rufus*
Birds	Calliope Hummingbird	*Stellula calliope*
Birds	Allen's Hummingbird	*Selasphorus sasin*
Birds	Belted Kingfisher	*Ceryle alcyon*
Birds	Northern Flicker	*Colaptes auratus*
Birds	Red-bellied Woodpecker	*Melanerpes carolinus*
Birds	Downy Woodpecker	*Piciodes pubescens*
Birds	Hairy Woodpecker	*Piciodes villosus*
Birds	Red-naped Sapsucker	*Sphyrapicus nuchalis*
Birds	Williamson's Sapsucker	*Sphyrapicus thyroideus*
Birds	Yellow-bellied Sapsucker	*Sphyrapicus varius*
Birds	Olive-sided Flycatcher	*Contopus cooperi*
Birds	Western Wood-Pewee	*Contopus sordidulus*
Birds	Alder Flycatcher	*Empidonax alnorum*
Birds	Yellow-bellied Flycatcher	*Empidonax flaviventris*
Birds	Hammond's Flycatcher	*Empidonax hammondii*
Birds	Least Flycatcher	*Empidonax minimus*
Birds	Dusky Flycatcher	*Empidonax oberholseri*
Birds	Cordilleran Flycatcher	*Empidonax occidentalis*
Birds	Willow Flycatcher	*Empidonax traillii*
Birds	Acadian Flycatcher	*Empidonax virescens*
Birds	Gray Flycatcher	*Empidonax wrightii*
Birds	Ash-throated Flycatcher	*Myiarchus cinerascens*
Birds	Great Crested Flycatcher	*Myiarchus crinitus*
Birds	Great Kiskadee	*Pitangus sulphuratus*
Birds	Vermilion Flycatcher	*Pyrocephalus rubinus*
Birds	Black Phoebe	*Sayornis nigricans*
Birds	Eastern Phoebe	*Sayornis phoebe*
Birds	Say's Phoebe	*Sayornis saya*
Birds	Fork-tailed Flycatcher	*Tyrannus savana*
Birds	Cassin's Kingbird	*Tyrannus vociferans*
Birds	Northern Shrike	*Lanius excubitor*
Birds	Cassin's Vireo	*Vireo cassinii*
Birds	Yellow-throated Vireo	*Vireo falvifrons*
Birds	Warbling Vireo	*Vireo gilvus*

Group	Common Name	Scientific Name
Birds	White-eyed Vireo	*Vireo griseus*
Birds	Red-eyed Vireo	*Vireo olivaceus*
Birds	Philadelphia Vireo	*Vireo phildelphicus*
Birds	Plumbeous Vireo	*Vireo plumbeus*
Birds	Blue-headed Vireo	*Vireo solitarius*
Birds	Gray Vireo	*Vireo vicinior*
Birds	Western Scrub Jay	*Aphelocoma coerulescens*
Birds	Gray-breasted Jay	*Aphelocoma ultramarina*
Birds	American Crow	*Corvus brachyrhynchos*
Birds	Common Raven	*Corvus corax*
Birds	Fish Crow	*Corvus ossifragus*
Birds	Blue Jay	*Cyanocitta cristata*
Birds	Steller's Jay	*Cyanocitta stelleri*
Birds	Pinyon Jay	*Gymnorhinus cyanocephalus*
Birds	Clark's Nutcracker	*Nucifraga columbiana*
Birds	Black-billed Magpie	*Pica pica*
Birds	Horned Lark	*Eremophilia alpestris*
Birds	Cliff Swallow	*Petrochelidon pyrrhonota*
Birds	Purple Martin	*Progne subis*
Birds	Bank Swallow	*Riparia riparia*
Birds	Northern Rough-winged Swallow	*Stelgidoptryx serripennis*
Birds	Tree Swallow	*Tachycineta bicolor*
Birds	Cave Swallow	*Petrochelidon fulva*
Birds	Violet-green Swallow	*Tachycineta thalassina*
Birds	Tufted Titmouse	*Baeolophus bicolor*
Birds	Juniper Titmouse	*Baeolophus griseus*
Birds	Black-capped Chickadee	*Poecile atricapillus*
Birds	Carolina Chickadee	*Poecile carolinensis*
Birds	Mountain Chickadee	*Poecile gambeli*
Birds	Bushtit	*Psaltriparus minimus*
Birds	Red-breasted Nuthatch	*Sitta canandensis*
Birds	White-breasted Nuthatch	*Sitta carolinensis*
Birds	Brown-headed Nuthatch	*Sitta pusilla*
Birds	Pygmy Nuthatch	*Sitta pygmaea*
Birds	Brown Creeper	*Certhia americana*
Birds	Canyon Wren	*Catherpes mexicanus*
Birds	Marsh Wren	*Cistothorus palustris*
Birds	Sedge Wren	*Cistothorus platensis*
Birds	Rock Wren	*Salpinctes obsoletus*
Birds	Bewick's Wren	*Thryomanes bewickii*
Birds	Carolina Wren	*Thryothorus ludovicianus*
Birds	House Wren	*Troglodytes aedon*

Appendix 3
Kansas's species that did not meet the Species of Greatest Conservation Need criteria.

Group	Common Name	Scientific Name
Birds	Winter Wren	*Troglodytes troglodytes*
Birds	Ruby-crowned Kinglet	*Regulus calendula*
Birds	Golden-crowned Kinglet	*Regulus satrapa*
Birds	Blue-gray Gnatcatcher	*Polioptila caerulea*
Birds	Veery	*Catharus fuscescens*
Birds	Hermit Thrush	*Catharus guttatus*
Birds	Gray-cheeked Thrush	*Catharus minimus*
Birds	Swainson's Thrush	*Catharus ustulatus*
Birds	Wood Thrush	*Hylocichla mustelina*
Birds	Varied Thrush	*Ixoreus naevius*
Birds	Northern Wheatear	*Oenanthe oenanthe*
Birds	Townsend's Solitaire	*Myadestes townsendi*
Birds	Mountain Bluebird	*Sialia currucoides*
Birds	Western Bluebird	*Sialia mexicana*
Birds	Eastern Bluebird	*Sialia sialis*
Birds	American Robin	*Turdus migratorius*
Birds	Gray Catbird	*Dumetella carolinensis*
Birds	Northern Mockingbird	*Mimus polyglottos*
Birds	Sage Thrasher	*Oreoscoptes montanus*
Birds	European Starling	*Sturnus vulgaris*
Birds	American Pipit	*Anthus rubescens*
Birds	Cedar Waxwing	*Bombycilla cedrorum*
Birds	Bohemian Waxwing	*Bombycilla garrulus*
Birds	Phainopepla	*Phainopepla nitens*
Birds	Black-throated Blue Warbler	*Dendroica caerulescens*
Birds	Bay-breasted Warbler	*Dendroica castanea*
Birds	Yellow-rumped Warbler	*Dendroica coronata*
Birds	Prairie Warbler	*Dendroica discolor*
Birds	Blackburnian Warbler	*Dendroica fusca*
Birds	Magnolia Warbler	*Dendroica magnolia*
Birds	Black-throated Gray Warbler	*Dendroica nigrescens*
Birds	Hermit Warbler	*Dendroica occidentalis*
Birds	Palm Warbler	*Dendroica palmarum*
Birds	Chestnut-sided Warbler	*Dendroica pensylvanica*
Birds	Yellow Warbler	*Dendroica petechia*
Birds	Pine Warbler	*Dendroica pinus*
Birds	Blackpoll Warbler	*Dendroica striata*
Birds	Cape May Warbler	*Dendroica tigrina*
Birds	Townsend's Warbler	*Dendroica townsendi*
Birds	Black-throated Green Warbler	*Dendroica virens*
Birds	Common Yellowthroat	*Geothlypis trichas*
Birds	Worm-eating Warbler	*Helmitheros vermivorus*

Group	Common Name	Scientific Name
Birds	Yellow-breasted Chat	*Icteria virens*
Birds	Swainson's Warbler	*Limnothlypis swainsonii*
Birds	Black-and-white Warbler	*Mniotilta varia*
Birds	Connecticut Warbler	*Oporornis agilis*
Birds	Mourning Warbler	*Oporornis philadelphia*
Birds	MacGillivray's Warbler	*Oporornis tolmiei*
Birds	Northern Parula	*Parula americana*
Birds	Ovenbird	*Seiurus aurocapillus*
Birds	Northern Waterthrush	*Seiurus noveboracensis*
Birds	American Redstart	*Setophaga ruticilla*
Birds	Painted Redstart	*Myioborus pictus*
Birds	Orange-crowned Warbler	*Vermivora celata*
Birds	Golden-winged Warbler	*Vermivora chrysoptera*
Birds	Tennessee Warbler	*Vermivora peregrina*
Birds	Blue-winged Warbler	*Vermivora pinus*
Birds	Nashville Warbler	*Vermivora ruficapilla*
Birds	Virginia Warbler	*Vermivora virginiae*
Birds	Canada Warbler	*Wilsonia canadensis*
Birds	Hooded Warbler	*Wilsonia citrina*
Birds	Wilson's Warbler	*Wilsonia pusilla*
Birds	Western Tanager	*Piranga ludoviviana*
Birds	Scarlet Tanager	*Piranga olivacea*
Birds	Summer Tanager	*Piranga rubra*
Birds	Bachman's Sparrow	*Aimophila aestivalis*
Birds	Rufous-crowned Sparrow	*Aimophila ruficeps*
Birds	Nelson's Sharp-tailed Sparrow	*Ammodramus caudacutus*
Birds	LeConte's Sparrow	*Ammodramus leconteii*
Birds	Sage Sparrow	*Amphispiza belli*
Birds	Black-throated Sparrow	*Amphispiza bilineata*
Birds	Fox Sparrow	*Passerella iliaca*
Birds	Dark-eyed Junco	*Junco hyemalis*
Birds	Swamp Sparrow	*Melospiza georgiana*
Birds	Lincoln's Sparrow	*Melospiza lincolnii*
Birds	Song Sparrow	*Melospiza melodia*
Birds	Savannah Sparrow	*Passerculus sandwichensis*
Birds	Fox Sparrow	*Passerella iliaca*
Birds	Green-tailed Towhee	*Pipilo chlorurus*
Birds	Eastern Towhee	*Pipilo erythrophthalmus*
Birds	Canyon Towhee	*Pipilo fuscus*
Birds	Snow Bunting	*Plectrophenax nivalis*
Birds	Vesper Sparrow	*Pooecetes gramineus*
Birds	Clay-colored Sparrow	*Spizella pallida*

Appendix 3
Kansas's species that did not meet the Species of Greatest Conservation Need criteria.

Group	Common Name	Scientific Name
Birds	Chipping Sparrow	*Spizella passerina*
Birds	White-throated Sparrow	*Zonotrichia albicollis*
Birds	Golden-crowned Sparrow	*Zonotrichia atricapilla*
Birds	White-crowned Sparrow	*Zonotrichia leucophrys*
Birds	Northern Cardinal	*Cardinalis cardinalis*
Birds	Pyrrhuloxia	*Cardinalis sinuatus*
Birds	Blue Grosbeak	*Guiraca caerulea*
Birds	Lazuli Bunting	*Passerina amoena*
Birds	Indigo Bunting	*Passerina cyanea*
Birds	Rose-breasted Grosbeak	*Pheucticus ludovicianus*
Birds	Black-headed Grosbeak	*Pheucticus melanocephalus*
Birds	Red-winged Blackbird	*Agelaius phoeniceus*
Birds	Hooded Oriole	*Icterus cucullatus*
Birds	Scott's Oriole	*Icterus parisorum*
Birds	Brown-headed Cowbird	*Molothrus ater*
Birds	Great-tailed Grackle	*Quiscalus mexicana*
Birds	Common Grackle	*Quiscalus quiscula*
Birds	Western Meadowlark	*Sturnella neglecta*

Group	Common Name	Scientific Name
Birds	Yellow-headed Blackbird	*Xanthocaphalus xanthocaphalus*
Birds	Brambling	*Fringilla montifringilla*
Birds	Common Redpoll	*Carduelis flammea*
Birds	Pine Siskin	*Carduelis pinus*
Birds	Lesser Goldfinch	*Carduelis psaltria*
Birds	American Goldfinch	*Carduelis tristis*
Birds	Cassin's Finch	*Carpodacus cassinii*
Birds	House Finch	*Carpodacus mexicanus*
Birds	Purple Finch	*Carpodacus purpureus*
Birds	Evening Grosbeak	*Coccothraustes vespertinus*
Birds	Red Crossbill	*Loxia curvirostra*
Birds	White-winged Crossbill	*Loxia leucoptera*
Birds	Pine Grosbeak	*Pinicola enucleator*
Birds	House Sparrow	*Passer domesticus*
Birds	Swallow-tailed Kite	*Elanoides forficatus*
Birds	Brewer's Sparrow	*Spizella breweri*

Group	Common Name	Scientific Name
Fish	Lake Sturgeon	*Acipenser fulvescens*
Fish	Longnose Gar	*Lepisosteus osseus*
Fish	Pugnose Shiner	*Notropis anogenus*
Fish	Redbreast Sunfish	*Lepomis auritus*
Fish	Western Sand Darter	*Ammocrypta clara*
Fish	Iowa Darter	*Etheostoma exile*
Fish	Shortnose Gar	*Lepisosteus platostomus*
Fish	Goldeye	*Hiodon alosoides*
Fish	Skipjack Herring	*Alosa chrysochloris*
Fish	Gizzard Shad	*Dorosoma cepedianum*
Fish	Central Stoneroller	*Campostoma anomalum*
Fish	Bluntface Shiner	*Cyprinella camura*
Fish	Red Shiner	*Cyprinella lutrensis*
Fish	Striped Shiner	*Luxilus chrysocephalus*
Fish	Redfin Shiner	*Lythrurus umbratilis*
Fish	Golden Shiner	*Notemigonus crysoleucas*
Fish	Emerald Shiner	*Notropis atherinoides*
Fish	Red River Shiner *	*Notropis bairdi*
Fish	Ghost Shiner	*Notropis buchanani*
Fish	Bigmouth Shiner	*Notropis dorsalis*
Fish	Blacknose Shiner (X)	*Notropis heterolepis*
Fish	Sand Shiner	*Notropis stranineus*

Group	Common Name	Scientific Name
Fish	Mimic Shiner	*Notropis volucellus*
Fish	Pugnose Minnow (X)	*Opsopoeodus emiliae*
Fish	Suckermouth Minnow	*Phenacobius mirabilis*
Fish	Bluntnose Minnow	*Pimephales notatus*
Fish	Fathead Minnow	*Pimephales promelas*
Fish	Slim Minnow	*Pimephales tenellus*
Fish	Bullhead Minnow	*Pimephales vigilax*
Fish	Creek Chub	*Semotilus atromaculatus*
Fish	River Carpsucker	*Carpiodes carpio*
Fish	Smallmouth Buffalo	*Ictiobus bubalus*
Fish	Bigmouth Buffalo	*Ictiobus cyprinellus*
Fish	Black Bullhead	*Ameiurus melas*
Fish	Yellow Bullhead	*Ameiurus natalis*
Fish	Brown Bullhead *	*Ameiurus nebulosis*
Fish	Blue Catfish	*Ictalurus furcatus*
Fish	Channel Catfish	*Ictalurus punctatus*
Fish	Flathead Catfish	*Pylodictis olivaris*
Fish	Northern Pike *	*Esox lucius*
Fish	Burbot (X)	*Lota lota*
Fish	Brook Silverside	*Labidesthes sicculus*
Fish	Northern Studfish	*Fundulus catenatus*
Fish	Blackstripe Topminnow	*Fundulus notatus*

Appendix 3
Kansas's species that did not meet the Species of Greatest Conservation Need criteria.

Group	Common Name	Scientific Name
Fish	Blackspotted Totminnow	*Fundulus Olivaceus*
Fish	Plains Topminnow	*Fundulus sciadicus*
Fish	Western Mosquitofish *	*Gambusia affinis*
Fish	White Bass	*Morone chrysops*
Fish	Green Sunfish	*Lepomis cyanellus*
Fish	Orangespotted Sunfish	*Lepomis humilis*
Fish	Bluegill	*Lepomis macrochirus*
Fish	Longear Sunfish	*Lepomis megalotis*
Fish	Redear Sunfish *	*Lepomis microlophus*
Fish	Smallmouth Bass	*Micropterus dolomieu*
Fish	Largemouth Bass	*Micropterus salmoides*

Group	Common Name	Scientific Name
Fish	White Crappie	*Pomoxis annularis*
Fish	Black Crappie *	*Pomoxis nigromanculatus*
Fish	Sauger	*Stizostedion canadense*
Fish	Walleye *	*Stizostedion vitreum*
Fish	Freshwater Drum	*Aplodinotus grunniens*
Fish	Spotted Bass	*Micropterus punctulatus*
Fish	Bowfin	*Amia calva*
Fish	Ozark Cavefish	*Amblyopsis rosae*

Group	Common Name	Scientific Name
Mammals	Virginia Opossum	*Didelphis virginiana*
Mammals	Southern Short-tailed Shrew	*Blarina hylophaga*
Mammals	Least Shrew	*Cryptotis parva*
Mammals	Hayden's Shrew	*Sorex haydenii*
Mammals	Eastern Mole	*Scalopus aquaticus*
Mammals	Northern Short-tailed Shrew	*Blarina brevicauda*
Mammals	Cinereus Shrew	*Sorex cinereus*
Mammals	Porcupine	*Erethizon dorsatum*
Mammals	Big Brown Bat	*Eptesicus fuscus*
Mammals	Silver-haired Bat	*Lasionycteris noctivagans*
Mammals	Eastern Red Bat	*Lasiurus borealis*
Mammals	Hoary Bat	*Lasiurus cinereus*
Mammals	Northern Long-eared Myotis	*Myotis spetentrionalis*
Mammals	Cave Myotis	*Myotis velifer*
Mammals	Evening Bat	*Mycticeius humeralis*
Mammals	Eastern Pipistrelle	*Pipistrellus subflavus*
Mammals	Big Free-tailed Bat	*Nyctinomops macrotis*
Mammals	Brazilian Free-tailed Bat	*Tadarida brasiliensis*
Mammals	Nine-banded Armadillo	*Dasypus novemcinctus*
Mammals	Black-tailed Jack Rabbit	*Lepus californicus*
Mammals	Desert Cottontail	*Sylvilagus audubonii*
Mammals	Eastern Cottontail	*Sylvilagus floridanus*
Mammals	Woodchuck	*Marmota monax*
Mammals	Eastern Gray Squirrel	*Sciurus carolinensis*
Mammals	Eastern Fox Squirrel	*Scirurus niger*
Mammals	Thirteen-lined Ground Squirrel	*Spermophilus tridecemlineatus*
Mammals	Eastern Chipmunk	*Tamias striatus*
Mammals	Plains Pocket Gopher	*Geomys bursarius*

Group	Common Name	Scientific Name
Mammals	Hispid Pocket Mouse	*Chaetodipus hispidus*
Mammals	Ord's Kangaroo Rat	*Dipodomys ordii*
Mammals	Plains Pocket Mouse	*Perognathus flavescens*
Mammals	Silky Pocket Mouse	*Perognathus flavus*
Mammals	Beaver	*Castor canadensis*
Mammals	Prairie Vole	*Microtus ochrogaster*
Mammals	Meadow Vole	*Microtus pennsylvanicus*
Mammals	Woodland Vole	*Microtus pinetorum*
Mammals	Eastern Woodrat	*Neotoma floridana*
Mammals	Southern Plains Woodrat	*Neotoma micropus*
Mammals	Common Muskrat	*Ondatra zibethicus*
Mammals	Northern Grasshopper Mouse	*Onchomys leucogaster*
Mammals	White-footed Mouse	*Peromyscus leucopus*
Mammals	Deer Mouse	*Peromyscus maniculatus*
Mammals	Western Harvest Mouse	*Reithrodontomys megalotis*
Mammals	Plains Harvest Mouse	*Reithrodontomys montanus*
Mammals	Hispid Cotton Rat	*Sigmodon hispidus*
Mammals	House Mouse	*Mus musculus**
Mammals	Norway Rat	*Rattus norvegicus**
Mammals	Black Rat	*Rattus rattus**
Mammals	Meadow Jumping Mouse	*Zapus hudsonius*
Mammals	North American Porcupine	*Erethizon dorsatum*
Mammals	Coyote	*Canis latrans*
Mammals	Gray Wolf (X)	*Canis lupus*
Mammals	Red Fox	*Vulpes vulpes*
Mammals	Grizzly Bear (X)	*Ursus arctos*
Mammals	Ringtail	*Bassariscus astutus*
Mammals	Northern Raccoon	*Procyon lotor*

Appendix 3
Kansas's species that did not meet the Species of Greatest Conservation Need criteria.

Group	Common Name	Scientific Name
Mammals	Northern River Otter	*Lutra canadensis*
Mammals	Striped Skunk	*Mephitis mephitis*
Mammals	Long-tailed Weasel	*Mustela frenata*
Mammals	Least Weasel	*Mustela nivalis*
Mammals	American Mink	*Mustela vision*
Mammals	American Badger	*Taxidea taxus*
Mammals	Bobcat	*Lynx rufus*

Group	Common Name	Scientific Name
Mammals	Wapiti	*Cervus elaphus*
Mammals	Mule Deer	*Odocoileus hemionus*
Mammals	White-tailed Deer	*Odocoileus virginianus*
Mammals	Pronghorn	*Antilocapra americana*
Mammals	Bison (X)	*Bos bison*

Group	Common Name	Scientific Name
Snakes	Slender Glass Lizard	*Ophisaurus attenuatus*
Snakes	Western Worm Snake	*Carphophis vermis*
Snakes	Ringneck Snake	*Diadophis punctatus*
Snakes	Flathead Snake	*Tantilla gracilis*
Snakes	Plains Blackhead Snake	*Tantilla nigriceps*
Snakes	Eastern Racer	*Coluber constrictor*
Snakes	Great Plains Rat Snake	*Pantherophis emoryi*
Snakes	Western Rat Snake	*Pantherophis obsoleta*
Snakes	Prairie Kingsnake	*Lampropeltis calligaster*
Snakes	Common Kingsnake	*Lampropeltis getula*
Snakes	Coachwhip	*Masticophis flagellum*
Snakes	Gopher Snake	*Pituophis catenifer*
Snakes	Plainbelly Water Snake	*Nerodia erythrogaster*
Snakes	Diamondback Water Snake	*Nerodia rhombifer*
Snakes	Northern Water Snake	*Nerodia sipedon*
Snakes	Graham's Crayfish Snake	*Regina grahamii*
Snakes	Brown Snake	*Storeria dekayi*
Snakes	Western Ribbon Snake	*Thamnophis proximus*
Snakes	Plains Garter Snake	*Thamnophis radix*
Snakes	Common Garter Snake	*Thamnophis sirtalis*
Snakes	Lined Snake	*Tropidoclonion lineatum*
Snakes	Copperhead	*Agkistrodon contortrix*
Turtles	Common Snapping Turtle	*Chelydra serpentina*
Turtles	Yellow Mud Turtle	*Kinosternon flavescens*
Turtles	Common Musk Turtle	*Sternotherus odoratus*
Turtles	Northern Painted Turtle	*Chrysemys picta*
Turtles	Ouachita Map Turtle	*Graptemys ouachitensis*
Turtles	False Map Turtle	*Graptemys pseudogeographica*
Turtles	Mississippi map Turtle	*Graptemys pseudogeographica kohnii*
Turtles	River Cooter	*Pseuemys concinna*
Turtles	Eastern Box Turtle	*Terrapene carolina*
Turtles	Ornate Box Turtle	*Terrapene ornata*
Turtles	Slider	*Trachemys scripta*
Turtles	Spiny Softshell	*Apalone spinifera*
Amphibians	Smallmouth Salamander	*Ambystoma texanum*
Amphibians	Plains Spadefoot	*Spea bombifrons*
Amphibians	American Toad	*Bufo americanus*
Amphibians	Great Plains Toad	*Bufo cognatus*
Amphibians	Woodhouse's Toad	*Bufo woodhousii*
Amphibians	Cope's Gray Treefrog	*Hyla chrysoscelis*
Amphibians	Gray Treefrog	*Hyla versicolor*
Amphibians	Spotted Chorus Frog	*Pseudacris clarkii*
Amphibians	Boreal Chorus Frog	*Pseudacris maculata*
Amphibians	Western Chorus Frog	*Pseudacris triseriata*
Amphibians	Plains Leopard Frog	*Rana blairi*
Amphibians	Bullfrog	*Rana catesbeiana*
Amphibians	Southern Leopard Frog	*Rana sphenocephala*
Amphibians	Great Plains Narrowmouth Toad	*Gastrophryne olivacea*
Lizards	Eastern Collard Lizard	*Crotaphytus collaris*
Lizards	Prairie Lizard	*Sceloporus consobrinus*
Lizards	Five-lined Skink	*Eumeces fasciatus*
Lizards	Great Plains Skink	*Eumeces obsoletus*
Lizards	Southern Prairie Skink	*Eumeces obtusirostris*
Lizards	Northern Prairie Skink	*Eumeces spetentrionalis*
Lizards	Ground Skink	*Scincella lateralis*

Appendix 3
Kansas's species that did not meet the Species of Greatest Conservation Need criteria.

Group	Common Name	Scientific Name
Lizards	Western Green Lacerta	*Lacerta bilineata**
Lizards	Italian Wall Lizard	*Podarcis sicula**

Group	Common Name	Scientific Name
Lizards	Six-lined Racerunner	*Aspidoscelis sexlineatus*

(T) means State Threatened (Federal threatened are included)
(E) means State Endangered (Federal endangered are included)
(X) means extirpated
* = not native, but considered in this analysis at the request of participants.

Appendix 4.
Related Management Plans

A summary of some of the existing conservation plans with goals and objectives pertinent to Kansas' Comprehensive Wildlife Conservation Plan.

Title/Org	Contact Person & email address (someone who knows the plan)	Scale			Focus			Conservation Goals Identified	Objectives Identified	Additional Notes
		Kansas	Regional	National	Species	Habitat/ Basin	General			
US Army Corps of Engineers	Everett.Laney@usace.army.mil		X		X	X	X	X	X	Design Memorandum Master Plans, Final Environmental Statements, Operational Mgmt Plans, and Real Estate Outgrants. Tulsa District: Big Hill, Council Grove, El Dorado, Elk City, Fall River, Marion, Toronto and John Redmond. Kansas City District: Clinton, Kanopolis, Milford, Perry, Pomona, Tuttle Creek and Wilson
Partners in Flight Landbird Conservation Plan	Terrell Rich Terry_rich@fws.gov 208-378-5347			X	X	X		X		
Kansas Alliance for Wetlands and Streams	John Bond jbond@kaws.org	X				X	X	X	X	Kansas Wetland and Riparian Areas Protection and Restoration Plan
Kansas Department of Health and Environment	Rob Beilfuss rbeilfus@kdhe.state.ks.us	X			X	X	X	X	X	Watershed Restoration and Protection Strategies (WRAPS Plan) – Targeted by the state for the basin planning process. Several plans for different basins are currently underway.
Quail Unlimited – Northern Bobwhite Conservation Initiative	Mike Christensen	X	X	X	X	X		X	X	
Natural Resource Conservation Service	Steve Parkin Steve.parkin@ks.usda.gov	X	X	X	X	X	X	X	X	They have plans for many types of conservation efforts
US Fish and Wildlife Service	Greg Kramos Greg_kramos@fws.gov	X	X	X	X	X	X	X	X	They have developed recovery plans for many different species that are Threatened or Endangered

Appendix 4.
Related Management Plans

Title/Org	Contact Person & email address (someone who knows the plan)	Scale			Focus			Conservation Goals Identified	Objectives Identified	Additional Notes
		Kansas	Regional	National	Species	Habitat/ Basin	General			
Central Plains/Playa Lakes Regional Shorebird Cons. Plan	Kansas: Helen Hands, KDWP		X		X	X		X		
Kansas State Forest Stewardship Plan	Bob Atchison Atchison@oznet.ksu.edu	X			X				X	

Appendix 5
Kansas Comprehensive Wildlife Conservation Plan
Habitats and Descriptions

Habitat Descriptions

Listed below is a description of the Comprehensive Wildlife Conservation Plan (CWCP) habitats. The CWCP habitats are based upon the land cover types (see Figure 2.) in the Final Report of the Kansas GAP Analysis Project. Further information can be found in Appendix 2.2 of the GAP Final Report.

1 **Deciduous Forest**	The Deciduous Forest habitat is made up of the Maple – Basswood Forest, Oak- Hickory Forest, Deciduous Forest-Mined Land, Mixed Oak Ravine, Oak Savanna and Deciduous Woodland habitats. Together, they comprise two percent of Kansas's lands.
2 **Bur Oak Woodland**	Bur Oak Woodland habitat is dominated by Bur Oak, Big Bluestem and Porcupine Needlegrass, mostly in small or linear patches, located in floodplains or adjacent to rivers and streams, in the Shortgrass and Central Mixed-grass Prairie Regions.
3 **Deciduous Floodplain**	The Deciduous Floodplain habitat is comprised of Pecan Floodplain Forest, Mixed Oak Floodplain Forest, Ash-Elm-Hackberry Floodplain Forest, Cottonwood Floodplain Forest, Maple Floodplain Forest, and the Cottonwood Floodplain Woodlands. These are temporarily flooded habitats. They comprise four percent of Kansas's lands.
4 **Evergreen (cedar)**	The Evergreen (cedar) habitat is Kansas GAP Forest Alliance habitat of Evergreen Forest – Disturbed Land. It consists of abandoned or neglected cropland upland sites in eastern and central KS that have been invaded by red cedar.
5 **Sandsage Shrubland**	Sand Sage, *Artemisia filifolia* is a primary species of the Sandsage Shrubland habitat. It comprises one percent of Kansas's lands.
6 **Riparian Shrubland**	The Riparian Shrubland habitat is a combination of Willow Shrubland (temporarily flooded), the (invasive) Salt Cedar or Tamarisk Shrubland of western KS, and Buttonbush Swamp (semi-permanently flooded).
7 **Tallgrass Prairie**	The Tallgrass Prairie habitat is comprised of the Tallgrass Prairieand Sandstone Glade/Prairie habitats located primarily in eastern Kansas. They comprise 13 percent of Kansas's lands.
8 **Sand Prairie**	The Sand Prairie habitat is located primarily in the central portion of Kansas. Sand Bluestem, *Andropogon hallii*, is a primary species.

Appendix 5
Kansas Comprehensive Wildlife Conservation Plan
Habitats and Descriptions

9 **Mixed Prairie**	The Mixed Prairie habitat is a combination of the Western Wheatgrass Prairie, Mixed Prairie and the Mixed Prairie – Disturbed. Located primarily in the Smoky Hill and High Plains regions of Kansas, this habitat type comprises 12 percent of Kansas's lands.
10 **Shortgrass Prairie**	The Shortgrass Prairie habitat is made up of the Shortgrass Prairie and Alkali Sacaton Prairie. Located in the High Plains region of Kansas, they comprise three percent of Kansas's lands.
11 **CRP Native Upland**	The CRP Native Upland habitat is the former cultivated areas re-seeded with (usually) native tall and mid-tall grasses. The dominant plants are: *Andropogon gerardii, Schizachyrium scoparium, Sorghastrum nutans,* and *Panicum virgatum.* This habitat is found statewide, but is primarily in southwestern Kansas.
12 **CRP Introduced Grass**	The CRP/Introduced Grass habitat is made up of the Non-Native Grassland and CRP (Conservation Reserve Program). This habitat type covers 10 percent of Kansas's lands.
13 **Herbaceous Wetland**	The Herbaceous Wetland habitat is comprised of the KS-GAP Wetland Alliances of Grass Playa Lake, Salt Marsh/Prairie, Spikerush Playa Lake, Playa Lake, Low or Wet Prairie, Freshwater marsh, Cattail Marsh, Forb Playa Lake, Cordgrass and Weedy Marsh.
14 **Cropland**	The Cropland habitat includes all lands in active agricultural production, including row crops and hay. Cropland covers 48 percent of Kansas's lands.
15 **Urban Areas**	The Urban Areas habitat includes city, town and subdivisions. It also includes man-made features, such as road cuts, abandoned structures, bridges, storm sewers, mining operations, oil fields, farm buildings, strip pits, landfills, airports, and railroad and road Right of Ways. They comprise one percent of Kansas's lands.
16 **Cave**	Subterranean caverns, including Karst formations in Lower Permian limestone, located primarily in the southern part of Kansas, and gypsum caves in the Flint Hills.
17 **Aquatic- Western Lotic (flowing waters)**	Rivers, streams, and their tributaries in the Arkansas, Smoky Hill, Saline, Solomon and Republican River Basins in Western Kansas.
18 **Aquatic-Western Lentic (still waters)**	Ponds, lakes, oxbows, and reservoirs in the Arkansas, Smoky Hill, Saline, Solomon and Republican River Basins in western Kansas.

Appendix 5
Kansas Comprehensive Wildlife Conservation Plan
Habitats and Descriptions

19	**Aquatic-Eastern Streams/Small Rivers**	Small rivers, streams, and their tributaries in the Neosho, Missouri, Verdigris, Eastern Walnut, Kansas, and Marais des Cygnes River Basins in eastern Kansas.
20	**Aquatic – Eastern Lentic (still waters)**	Ponds, lakes, oxbows, and reservoirs in the Missouri, Neosho, Verdigris, eastern Walnut, Kansas, and Marais des Cygnes River Basins in eastern Kansas.
21	**Aquatic – Eastern Large Rivers**	Large rivers,-such as the Missouri, Arkansas and Kansas Rivers.
22	**Seeps and Springs**	Sources of water that come from the ground. Seeps usually ooze slowly from between rock strata. They are found throughout Kansas.

Appendix 6.
Kansas' Species of Greatest Conservation Need
Population Status and Trend

This table includes Kansas' Species of Greatest Conservation Need with information about the current population status and population trends for each species. Species distribution and abundance information is based on the best available information. In many cases, additional information is needed and will be gathered during the first round of implementation.

Kansas' Species of Greatest Conservation Need Population Status and Trend			Status				Trend			
Group	**Common Name**	**Scientific Name**	**Low**	**Medium**	**Abundant**	**Unknown**	**Declining**	**Stable**	**Increasing**	**Unknown**
Amphibians	Eastern Tiger Salamander	*Ambystoma tigrinum*				X				X
Amphibians	Eastern Newt (T)	*Notophtalmus viridescens*		X				X		
Amphibians	Longtail Salamander (T)	*Eurycea longicauda*				X				X
Amphibians	Cave Salamander (E)	*Eurycea lucifuga*				X				X
Amphibians	Many-ribbed	*Oklahoma tyenrehsis*				X				X
Amphibians	Grotto Salamander (E)	*Typhlotriton spelaeus*				X				X
Amphibians	Common Mudpuppy	*Necturus maculosus*				X				X
Amphibians	Green Toad (T)	*Bufo debilis insidior*		X				X		
Amphibians	Red-spotted Toad	*Bufo punctatus*		X				X		
Amphibians	Northern Cricket Frog	*Acris crepitans*			X		X			
Amphibians	Spring Peeper (T)	*Pseudacris crucifer*			X			X		
Amphibians	Strecker's Chorus Frog	*Pseudacris streckeri*		X				X		
Amphibians	Crawfish Frog	*Rana areolata*		X			X			
Amphibians	Green Frog (T)	*Rana clamitans*		X						X
Amphibians	Pickerel Frog (X)	*Rana palustris*				X				X
Amphibians	Eastern Narrowmouth	*Gastrophryne carolinensis*		X						X
Amphibians	Redriver Mudpuppy	*Necturus louisiansi*				X				X
Birds	Western Grebe	*Aechmophorus*	X							X
Birds	Eared Grebe	*Podiceps nigricollis*	X							X
Birds	American White Pelican	*Pelecanus*		X					X	
Birds	Great Egret	*Ardea alba*		X						X
Birds	American Bittern	*Botaurus lentiginosus*	X							X
Birds	Little Blue Heron	*Egretta caerulea*	X							X
Birds	Snowy Egret	*Egretta thula*		X					X	
Birds	Least Bittern	*Ixobrychus exilis*	X							X
Birds	Black-crowned Night-	*Nycticorax nycticorax*	X							X
Birds	Northern Pintail	*Anas acuta*	X				X			
Birds	Canvasback	*Aythya valisineria*	X							X
Birds	Golden Eagle	*Aquila chrysaetos*	X				X			
Birds	Ferruginous Hawk	*Buteo regalis*	X				X			
Birds	Swainson's Hawk	*Buteo swainsoni*		X			X			
Birds	Bald Eagle (T)	*Haliaeetus leucocephalus*	X						X	

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Kansas' Species of Greatest Conservation Need
Population Status and Trend

This table includes Kansas' Species of Greatest Conservation Need with information about the current population status and population trends for each species. Species distribution and abundance information is based on the best available information. In many cases, additional information is needed and will be gathered during the first round of implementation.

Kansas' Species of Greatest Conservation Need Population Status and Trend			Status				Trend			
Group	**Common Name**	**Scientific Name**	**Low**	**Medium**	**Abundant**	**Unknown**	**Declining**	**Stable**	**Increasing**	**Unknown**
Birds	Mississippi Kite	*Ictinia mississippiensis*		X					X	
Birds	Peregrine Falcon (E)	*Falco peregrinus*	X							X
Birds	Greater Prairie-Chicken	*Tympanuchus cupido*		X			X			
Birds	Lesser Prairie-Chicken	*Tympanuchus*	X				X			
Birds	Scaled Quail	*Callipepla squamata*	X							X
Birds	Northern Bobwhite	*Colinus virginianus*		X			X			
Birds	Black Rail	*Laterallus jamaicensis*	X							X
Birds	Whooping Crane (E)	*Grus americana*	X						X	
Birds	Snowy Plover (T)	*Charadrius alexandrinus*	X				X			
Birds	Piping Plover (T)	*Charadrius melodius*	X					X		
Birds	Mountain Plover	*Charadrius montanus*	X							X
Birds	American Golden-Plover	*Pluvialis dominica*		X			X			
Birds	Black-bellied Plover	*Pluvialis squatarola*	X				X			
Birds	Black-necked Stilt	*Himantopus mexicanus*	X					X		
Birds	American Avocet	*Recurvirostra americana*		X				X		
Birds	Upland Sandpiper	*Bartramia longicauda*			X			X		
Birds	Baird's Sandpiper	*Calidris bairdii*		X				X		
Birds	White-rumped	*Calidris fuscicollis*			X			X		
Birds	Stilt Sandpiper	*Calidris himantopus*	X				X			
Birds	Pectoral Sandpiper	*Calidris melanotos*	X					X		
Birds	Least Sandpiper	*Calidris minutilla*		X				X		
Birds	Semipalmated Sandpiper	*Calidris pusilla*			X			X		
Birds	Long-billed Dowitcher	*Limnodromus scolopaceus*		X			X			
Birds	Marbled Godwit	*Limosa fedoa*	X				X			
Birds	Hudsonian Godwit	*Limosa haemastica*	X				X			
Birds	Long-billed Curlew	*Numenius americanus*	X				X			
Birds	Eskimo Curlew (E)	*Numenius borealis*	X							X
Birds	Wilson's Phalarope	*Phalaropus tricolor*			X			X		
Birds	Lesser Yellowlegs	*Tringa flavipes*		X				X		
Birds	Greater Yellowlegs	*Tringa melanoleuca*		X				X		
Birds	Buff-breasted Sandpiper	*Tryngites subruficollis*	X							X
Birds	Black Tern	*Chlidonias niger*		X						X

Appendix 6.
Kansas' Species of Greatest Conservation Need
Population Status and Trend

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Kansas' Species of Greatest Conservation Need Population Status and Trend			Status				Trend			
Group	**Common Name**	**Scientific Name**	**Low**	**Medium**	**Abundant**	**Unknown**	**Declining**	**Stable**	**Increasing**	**Unknown**
Birds	Least Tern (E)	*Sterna antillarum*	X					X		
Birds	Forster's Tern	*Sterna forsteri*	X							X
Birds	Black-billed Cuckoo	*Coccyzus erythropthalmus*	X				X			
Birds	Barn Owl	*Tyto alba*	X				X			
Birds	Short-eared Owl	*Asio flammeus*	X							X
Birds	Burrowing Owl	*Athene cunicularia*	X							X
Birds	Chuck-will's-widow	*Caprimulgus carolinensis*		X				X		
Birds	Whip-poor-will	*Caprimulgus vociferus*		X			X			
Birds	Common Nighthawk	*Chordeiles minor*		X				X		
Birds	Common Poorwill	*Phalaenoptilus nuttallii*		X			X			
Birds	Pileated Woodpecker	*Dryocopus pileatus*	X						X	
Birds	Red-headed	*Melanerpes*			X			X		
Birds	Lewis's Woodpecker	*Melanerpes lewis*	X							X
Birds	Ladder-backed	*Piciodes scalaris*	X							X
Birds	Eastern Wood-Pewee	*Contopus virens*			X		X			
Birds	Scissor-tailed Flycatcher	*Tyrannus forficatus*			X			X		
Birds	Eastern Kingbird	*Tyrannus tyrannus*			X			X		
Birds	Western Kingbird	*Tyrannus verticalis*			X			X		
Birds	Loggerhead Shrike	*Lanius ludovicianus*	X				X			
Birds	Black-capped Vireo (E)	*Vireo atricapilla*				X				X
Birds	Bell's Vireo	*Vireo bellii*		X			X			
Birds	Chihuahuan Raven	*Corvus cryptoleucus*	X							X
Birds	Curve-billed Thrasher	*Toxostoma curcirostre*	X							X
Birds	Brown Thrasher	*Toxostoma rufum*			X		X			
Birds	Sprague's Pipit	*Anthus spragueii*	X							X
Birds	Cerulean Warbler	*Dendroica cerulea*	X				X			
Birds	Yellow-throated Warbler	*Dendroica dominica*	X					X		
Birds	Kentucky Warbler	*Oporornis formosus*		X			X			
Birds	Prothonotary Warbler	*Protonotaria citrea*	X							X
Birds	Louisiana Waterthrush	*Seiurus motacilla*		X						X
Birds	Cassin's Sparrow	*Aimophila cassinii*	X							X
Birds	Baird's Sparrow	*Ammodramus bairdii*	X							X

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Group	**Common Name**	**Scientific Name**	**Low**	**Medium**	**Abundant**	**Unknown**	**Declining**	**Stable**	**Increasing**	**Unknown**
Birds	Henslow's Sparrow	*Ammodramus henslowii*	X				X			
Birds	Grasshopper Sparrow	*Ammodramus savannarum*			X		X			
Birds	Lark Bunting	*Calamospiza melanocorys*			X		X			
Birds	McCown's Longspur	*Calcarius mccownii*				X				X
Birds	Chestnut-collared	*Calcarius ornatus*	X							X
Birds	Smith's Longspur	*Calcarius pictus*	X							X
Birds	Lark Sparrow	*Chondestes grammacus*			X		X			
Birds	Spotted Towhee	*Pipilo maculatus*		X						X
Birds	American Tree Sparrow	*Spizella arborea*			X					X
Birds	Field Sparrow	*Spizella pusilla*			X			X		
Birds	Harris' Sparrow	*Zonotrichia querula*			X					X
Birds	Painted Bunting	*Passerina ciris*	X							X
Birds	Dickcissel	*Spiza americana*			X		X			
Birds	Bobolink	*Dolichonyx orzivorus*	X				X			
Birds	Rusty Blackbird	*Euphagus carolinus*	X				X			
Birds	Brewer's Blackbird	*Euphagus cyanocephalus*	X							X
Birds	Bullock's Oriole	*Icterus bullockii*		X				X		
Birds	Baltimore Oriole	*Icterus galbula*			X		X			
Birds	Orchard Oriole	*Icterus spurius*		X						X
Birds	Eastern Meadowlark	*Sturnella magna*			X		X			
Crustaceans	Neosho Midget Crayfish	*Orconectes macrus*	X							X
Crustaceans	Calico Crayfish	*Orconectes immunis*		X						X
Crustaceans	A Crayfish	*Orconectes luteus*	X							X
Crustaceans	Devil Crayfish	*Orconectes diogenes*				X				X
Crustaceans	A Crayfish	*Orconectes nais*				X				X
Crustaceans	A Crayfish	*Orconectes neglectus*		X				X		
Crustaceans	A Crayfish	*Orconectes palmeri*	X					X		
Crustaceans	Virile Crayfish	*Orconectes virilis*			X			X		
Crustaceans	Prairie Crayfish	*Procambarus gracilis*		X				X		
Crustaceans	A Crayfish	*Procambarus simulans*				X				X
Fish	Chestnut Lamprey (T)	*Ichthyomyzon castaneus*	X							X
Fish	Pallid Sturgeon (E)	*Scaphirhynchus albus*	X				X			

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Group	**Common Name**	**Scientific Name**	**Low**	**Medium**	**Abundant**	**Unknown**	**Declining**	**Stable**	**Increasing**	**Unknown**
Fish	Shovelnose Sturgeon	*Scaphirhynchus*	X							X
Fish	Paddlefish	*Polyodon spathula*		X				X		
Fish	Spotted Gar	*Lispisosteus oculatus*		X				X		
Fish	Bigeye Chub (X)	*Hybopsis amblops*	X				X			
Fish	American Eel	*Anguilla rostrata*	X				X			
Fish	Spotfin Shiner	*Cyprinella spiloptera*	X				X			
Fish	Gravel Chub	*Erimystax x-punctatus*	X							X
Fish	Western Silvery Minnow	*Hybognathus argyritis*	X				X			
Fish	Brassy Minnow	*Hybognathus hankinsoni*	X				X			
Fish	Plains Minnow	*Hybognathus placitus*	X				X			
Fish	Cardinal Shiner	*Luxilus cardinalis*	X					X		
Fish	Common Shiner	*Luxilus cornutus*	X				X			
Fish	Sturgeon Chub (T)	*Macrhybopsis gelida*	X				X			
Fish	Sicklefin Chub (E)	*Macrhybopsis meeki*	X				X			
Fish	Silver Chub (E)	*Macrhybopsis storeriana*	X				X			
Fish	Peppered Chub (E)	*Macrhyhopsis tetranema*	X				X			
Fish	Redspot Chub (T)	*Nocomis asper*	X				X			
Fish	Hornyhead Chub (T)	*Nocomis biguttatus*	X				X			
Fish	River Shiner	*Notropis blennius*	X							X
Fish	Bigeye Shiner	*Notropis boops*	X							X
Fish	Arkansas River Shiner	*Notropis girardi*	X				X			
Fish	Ozark Minnow	*Notropis nubilus*	X							X
Fish	Silverband Shiner (T)	*Notropis shumardi*	X				X			
Fish	Topeka Shiner (T)	*Notropis topeka*	X				X			
Fish	Southern Redbelly Dace	*Phoxinus erythrogaster*	X				X			
Fish	Flathead Chub (T)	*Platygobio garcilis*	X				X			
Fish	Blacknose Dace	*Rhinichthys obtuses*	X							X
Fish	Quillback	*Carpiodes cyprinus*	X							X
Fish	Highfin Carpsucker (X)	*Carpiodes velifer*	X				X			
Fish	White Sucker	*Catostomus commersonii*	X							X
Fish	Blue Sucker	*Cycleptus elongatus*		X						X
Fish	Northern Hogsucker	*Hypentelium nigricans*	X				X			

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Group	**Common Name**	**Scientific Name**	**Low**	**Medium**	**Abundant**	**Unknown**	**Declining**	**Stable**	**Increasing**	**Unknown**
Fish	Black Buffalo	*Ictiobus niger*	X							X
Fish	Spotted Sucker	*Minytrema melanops*	X				X			
Fish	River Redhorse	*Moxostoma carinatum*	X				X			
Fish	Black Redhorse	*Moxostoma duquesnii*	X							X
Fish	Golden Redhorse	*Moxostoma erythrurum*		X						X
Fish	Shorthead Redhorse	*Moxostoma*		X						X
Fish	Slender Madtom	*Noturus exilis*		X				X		
Fish	Stonecat	*Noturus flavus*			X			X		
Fish	Tadpole Madtom	*Noturus gyrinus*	X					X		
Fish	Brindled Madtom	*Noturus miurus*	X							X
Fish	Freckled Madtom	*Noturus nocturnus*		X						X
Fish	Neosho Madtom (T)	*Noturus placidus*	X					X		
Fish	Northern Plains Killifish	*Fundulus kansae*	X				X			
Fish	Banded Sculpin	*Cottus carolinae*	X				X			
Fish	Warmouth	*Lepomis gulosis*	X							X
Fish	Greenside Darter	*Etheostoma blennioides*	X				X			
Fish	Bluntnose Darter	*Etheostoma chlorosoma*	X							X
Fish	Arkansas Darter (T)	*Etheostoma cragini*	X				X			
Fish	Fantail Darter	*Etheostoma flabellare*	X							X
Fish	Slough Darter	*Etheostoma gracile*	X							X
Fish	Least Darter	*Etheostoma microperca*	X							X
Fish	Johnny Darter	*Etheostoma nigrum*		X			X			
Fish	Stippled Darter	*Etheostoma punctulatum*	X							X
Fish	Orangethroat Darter	*Etheostoma spectabile*			X			X		
Fish	Speckled Darter	*Etheostoma stigmaeum*	X							X
Fish	Redfin Darter	*Etheostoma whipplii*	X							X
Fish	Banded Darter	*Etheostoma zonale*	X							X
Fish	Logperch	*Percina caprodes*			X			X		
Fish	Channel Darter	*Percina copelandi*				X				X
Fish	Blackside Darter (T)	*Percina maculata*	X				X			
Fish	Slenderhead Darter	*Percina phoxocephala*			X			X		
Fish	River Darter	*Percina shumardi*	X							X

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Group	**Common Name**	**Scientific Name**	**Low**	**Medium**	**Abundant**	**Unknown**	**Declining**	**Stable**	**Increasing**	**Unknown**
Fish	Shoal Chub	*Macrhybopsis hyostoma*	X				X			
Gastropods	Sharp Hornsnail (T)	*Pleurocera acuta*	X							X
Gastropods	Slender Walker Snail (E)	*Pomatiopsis lapidaria*	X							X
Gastropods	Delta Hydrobe	*Probythinella emarginata*	X							X
Insect	Regal Fritillary	*Speyeria idalia*		X						X
Insect	Monarch	*Danaus plexippus*			X		X			
Insect	Mottled Duskywing	*Erynnis martialis*				X				X
Insect	Ottoe Skipper	*Hesperia ottoe*				X				X
Insect	Dotted Skipper	*Hesperia attralus attalus*				X				X
Insect	Byssus Skipper	*Problema byssus*				X				X
Insect	Arogos Skipper	*Atrytone arogos*				X				X
Insect	Two-spotted Skipper	*Euphyes bimacula illinois*				X				X
Insect	Bell's Roadside Skipper	*Amblyscirtes belli*				X				X
Insect	Linda's Roadside	*Amblyscirtes linda*	X							X
Insect	Whitney's Underwing	*Catocala whitneyi*				X				X
Insect	Sage Sphinx	*Sphinx eremitoides*				X				X
Insect	A Mayfly (From Ks.)	*Leptophlebia konza*	X							X
Insect	A Mayfly	*Siphlonurus minnoi*				X				X
Insect	Ozark Springfly	*Helopicus nalatus*				X				X
Insect	Austin Springfly	*Hydroperla fugitans*	X							X
Insect	Gray Petaltail	*Tachopteryx thoreyi*	X							X
Insect	Ozark Emerald	*Somatochlora ozarkensis*	X							X
Insect	Bleached Skimmer	*Libellula composita*				X				X
Insect	Prairie Mole Cricket	*Gryllotalpa major*	X							X
Insect	American Burying	*Nicrophorus americanus*	X							X
Insect	Scott Optioservus	*Optioservus phaeus*	X					X		
Insect	A Spur-throat	*Melanoplus beameri*				X				X
Insect	Low-ridged Pygmy	*Nomotettix parvus*				X				X
Insect	A Prongill Mayfly	*Paraleptophlebia*				X				X
Isopods	A Cave Isopod	*Caecidotea metcalfi*				X				X
Isopods	An Isopod	*Caecidotea tridentata*				X				X
Isopods	An isopod	*Caecidotea steevesi*				X				X

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Group	**Common Name**	**Scientific Name**	**Low**	**Medium**	**Abundant**	**Unknown**	**Declining**	**Stable**	**Increasing**	**Unknown**
Isopods	A cave obligate isopod	*Caecidotea simulator*				X				X
Mammals	Pallid Bat	*Antrozous pallidus*	X							X
Mammals	Gray Myotis (E)	*Myotis grisescens*	X							X
Mammals	Western Small-footed	*Myotis ciliolabrum*	X							X
Mammals	Little Brown Myotis	*Myotis lucifugus*	X				X			
Mammals	Townsend's Big-eared	*Corynorhinus townsendii*	X					X		
Mammals	White-tailed Jack Rabbit	*Lepus townsendii*				X				X
Mammals	Swamp Rabbit (X)	*Sylvilagus aquaticus*	X							X
Mammals	Black-tailed Prairie Dog	*Cynomys ludovicianus*	X				X			
Mammals	Southern Flying Squirrel	*Glaucomys volans*	X							X
Mammals	Franklin's Ground	*Spermophilus franklinii*	X							X
Mammals	Spotted Ground Squirrel	*Spermophilus spilosoma*		X				X		
Mammals	Yellow-faced Pocket	*Cratogeomys castanops*		X				X		
Mammals	Texas Mouse	*Peromyscus attwateri*		X				X		
Mammals	Fulvous Harvest Mouse	*Reithrodontomys*	X							X
Mammals	Southern Bog Lemming	*Synaptomys cooperi*	X							X
Mammals	Common Gray Fox	*Urocyon cinereoargenteus*	X							X
Mammals	Swift Fox	*Vulpes velox*			X			X		
Mammals	American Black Bear	*Ursus americanus*	X							X
Mammals	Black-footed Ferret (E)	*Mustela nigripes*				X				X
Mammals	Spotted Skunk (T)	*Spilogale putorius*	X							X
Mammals	Mountain Lion	*Puma concolor*	X							X
Mussels	Round Pigtoe Mussel	*Pleurobema sintoxia*	X				X			
Mussels	Elktoe (E)	*Alasmidonta marginata*	X				X			
Mussels	Flat Floater	*Anodonta suborbiculata*	X							X
Mussels	Cylindrical Papershell	*Anodontoides*	X				X			
Mussels	Rock-Pocketbook (T)	*Arcidens confragosus*	X							X
Mussels	Spectaclecase (X)	*Cumberlandia monodonta*	X							X
Mussels	Western Fanshell (E)	*Cyprogenia aberti*	X							X
Mussels	Butterfly (T)	*Ellipsaria lineolata*	X				X			
Mussels	Spike	*Elliptio dilatata*	X				X			
Mussels	Snuffbox (X)	*Epioblasma triquetra*				X				X

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Group	**Common Name**	**Scientific Name**	**Low**	**Medium**	**Abundant**	**Unknown**	**Declining**	**Stable**	**Increasing**	**Unknown**
Mussels	Wabash Pigtoe	*Fusconaia flava*		X				X		
Mussels	Neosho Mucket (E)	*Lampsilis rafinesqueana*	X				X			
Mussels	Fatmucket	*Lampsilis siliquoidea*		X			X			
Mussels	Yellow Sandshell	*Lampsilis teres*	X					X		
Mussels	Fluted-Shell (T)	*Lasmigona costata*	X				X			
Mussels	Washboard	*Megalonaias nervosa*		X						X
Mussels	Bleufer	*Potamilus purpuratus*		X			X			
Mussels	Ouachita Kidneyshell	*Ptychobranchus*	X					X		
Mussels	Rabbitsfoot (E)	*Quadrula cylindrica*	X				X			
Mussels	Monkeyface	*Quadrula metanevra*		X				X		
Mussels	Wartyback	*Quadrula nodulata*	X							X
Mussels	Mapleleaf	*Quadrula quadrula*			X			X		
Mussels	Fawnsfoot	*Truncilla donaciformis*		X				X		
Mussels	Deertoe	*Truncilla truncata*	X				X			
Mussels	Pondhorn	*Uniomerus tetralasmus*	X							X
Mussels	Ellipse Mussel (E)	*Venustaconcha*	X							X
Mussels	Mucket (E)	*Actinonaias ligamenta*	X				X			
Mussels	Slippershell (X)	*Alasmidonta viridis*				X				X
Mussels	Threeridge	*Amblema plicata*			X		X			
Mussels	Purple Wartyback	*Cyclonaias tuberculata*	X							X
Mussels	Plain Pocketbook	*Lampsilis cardium*		X			X			
Mussels	White Heelsplitter	*Lasmigona complanata*		X				X		
Mussels	Fragile Papershell	*Leptodea fragilis*			X				X	
Mussels	Pondmussel	*Ligumia subrostrata*			X					X
Mussels	Threehorn Wartyback	*Obliquaria reflexa*		X				X		
Mussels	Pink Heelsplitter	*Potamilus alatus*		X			X			
Mussels	Pink Papershell	*Potamilus ohiensis*			X				X	
Mussels	Giant Floater	*Pyganodon grandis*			X			X		
Mussels	Pimpleback	*Quadrula pustulosa*		X						X
Mussels	Creeper	*Strophitus undulatus*		X				X		
Mussels	Lilliput	*Toxoplasma parvus*		X				X		
Mussels	Pistolgrip	*Tritogonia verrucosa*		X						X

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Group	**Common Name**	**Scientific Name**	**Low**	**Medium**	**Abundant**	**Unknown**	**Declining**	**Stable**	**Increasing**	**Unknown**
Mussels	Black Sandshell (X)	*Ligumia recta*	X				X			
Planarians	Kansas Planarian	*Sphalloplana kansensis*				X				X
Reptiles	Lesser Earless Lizard	*Holbrookia maculata*				X	X			
Reptiles	Texas Horned Lizard	*Phrynosoma cornutum*			X			X		
Reptiles	Coal Skink	*Eumeces anthracinus*	X							X
Reptiles	Broadhead Skink (T)	*Eumeces laticeps*				X				X
Reptiles	Texas Blind Snake (T)	*Leptotyphlops dulcis*			X					X
Reptiles	Western Hognose Snake	*Heterodon nasicus*		X				X		
Reptiles	Eastern Hognose Snake	*Heterodon platirhinos*				X				X
Reptiles	Night Snake (T)	*Hypsiglena torquata*			X			X		
Reptiles	Eastern Glossy Snake	*Arizona elegans*		X				X		
Reptiles	Milk Snake	*Lampropeltis triangulum*			X					X
Reptiles	Rough Green Snake	*Opheodrys aestivus*			X					X
Reptiles	Longnose Snake (T)	*Rhinocheilus lecontei*		X				X		
Reptiles	Ground Snake	*Sonora semiannulata*		X				X		
Reptiles	Redbelly Snake (T)	*Storeria occipitomaculata*	X							X
Reptiles	Checkered Garter Snake	*Thamnophis marcianus*	X							X
Reptiles	Texas Garter Snake	*Thamnophis sirtalis*		X				X		
Reptiles	Rough Earth Snake	*Virginia striatula*		X				X		
Reptiles	Smooth Earth Snake (T)	*Virginia valeriae*		X				X		
Reptiles	Cottonmouth	*Agkistrodon piscivorus*	X							X
Reptiles	Timber Rattlesnake	*Crotalus horridus*		X			X			
Reptiles	Prairie Rattlesnake	*Crotalus viridis*			X					X
Reptiles	Massasauga	*Sistrurus catenatus*			X			X		
Turtles	Alligator Snapping	*Macrochelys temminckii*	X							X
Turtles	Common Map Turtle (T)	*Graptemys geographica*	X				X			
Turtles	Smooth Softshell	*Apalone mutica*				X	X			

Appendix 7.
Kansas' Comprehensive Wildlife Conservation Plan
Road Map to the Eight Federal Required Elements

This appendix is provided as a guide to those who are evaluating this document in terms of the eight congressionally required elements.

The following comments and passages describe how each required element was addressed in the development of the Comprehensive Wildlife Conservation Plan. Please refer to the following chapters and page numbers to examine how each required element was addressed in the development of the Comprehensive Wildlife Conservation Plan. *The references to Conservation Regions/Key Habitats are examples; please refer to the Table of Contents for page numbers to determine how those elements were addressed for each Conservation Region/Key Habitat.*

Element 1:

Information on the distribution and abundance of species of wildlife, including low and declining populations as the state deems appropriate, which are indicative of the diversity and health of the state's wildlife:

General Comment: Kansas GAP and NatureServe were heavily relied upon at the start of the process for species lists, distribution and global rankings. Experts within the Department, and known experts throughout the state were individually contacted, and asked to assist in filling out the SCGN matrices. Later by a questionnaire containing the compiled information was sent to a list of experts and concerned organizations, and their comments solicited. Lastly, a Summit of invited experts was held.. This provided us the best available information about the diversity and health of the Kansas' wildlife.

Sources of information

Chapter	**Page**
Approach: Organization Structure; Public Involvement and Partnership	4-6
Methods: Compiling Species List, Defining Habitats and Conservation Regions; Compiling Questionnaire	6-10
Statewide Perspective: Overall, Statewide Issues	14-25
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Abundance and distribution information

Chapter	**Page**
Distribution -Each Habitat section in the Conservation Region Chapters includes a table that lists the species of greatest conservation need found in that habitat. This information was gathered by consensus of experts at the Summit Example: Shortgrass Prairie Conservation Region: Sandsage Shrubland Habitat Table 2	32
Abundance and distribution - Experts identified where adequate abundance and /or distribution information was not available. These concerns were listed as issues and strategies. Example: Central Mixed Grass Prairie Conservation Region: Mixed Grass &	53

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Sand Prairie Habitats	
Abundance - Appendix 1: Kansas's Species of Greatest Conservation Need - Selection and Ranking - Abundance (Criterion 6) criteria was used in the ranking.	113
Abundance - Appendix 6: Kansas' Species of Greatest Conservation Need – Population Trends and Status - This table provides abundance information.	147

Low and declining population information

Chapter	**Page**
Methods: Compiling Species List, Defining Habitats and Conservation Regions; Compiling Questionnaire	6-10
Declining populations - Appendix 1: Kansas's Species of Greatest Conservation Need - Selection and Ranking - Abundance criterion was used in their selection.	113
Appendix 6: Kansas' Species of Greatest Conservation Need – Population Trends and Status - This table provides information about low and declining populations.	144
If the experts identified that adequate information about low and declining populations was not available; these concerns were listed as issues and strategies. Example: Shortgrass Prairie Conservation Region: Shortgrass Prairie Habitat	29

Consideration of all major groups of wildlife.

Chapter	**Page**
Statewide Perspective: Kansas Wildlife Resource – authority of agency	14-16
Methods: Compiling Species List, Defining Habitats and Conservation Regions; Compiling Questionnaire - how all major groups were considered	6-10
Appendix 1: Kansas's Species of Greatest Conservation Need - Selection and Ranking - a list of those species selected	113
Appendix 2: Kansas Selection and Ranking Criteria for Species of Greatest Conservation Need - the criteria used	121
Appendix 3: Kansas's Species that did not meet Species of Greatest Conservation Need Criteria - those species not selected	124
Plan Review and Revision - describes how species will be reviewed in the future	107

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Process used to select the species in greatest need of conservation.

Chapter	Page
Approach: Organization Structure; Public Involvement and Partnership	4-6
Methods: Compiling Species List, Defining Habitats and Conservation Regions; Compiling Questionnaire	6-10
Appendix 2: Kansas Selection and Ranking Criteria for Species of Greatest Conservation Need - All species were evaluated using these criteria.	121
Appendix 1: Kansas's Species of Greatest Conservation Need - Selection and Ranking - a list of those species selected	113

Element 2:

Descriptions of locations and relative condition of key habitats and community types essential to conservation of species identified in (1):

General Comment: Kansas GAP has maps of habitat types. The 40+ types were combined to make the 14 upland types that were considered in the CWCP. Urban Areas, and Caves were added, and 5 aquatic types were defined with the help of in-house fisheries experts. Kansas used the questionnaire and the experts at the Summit to identify the habitats by Conservation Region, to identify the Key Habitats for each Conservation Region and to define the relative condition of each Key Habitat.

Available level of detail for habitats, and identification of research needs.

Chapter	Page
Approach: Organization Structure; Public Involvement and Partnership	4-6
Methods: Compiling Species List, Defining Habitats and Conservation Regions; Compiling Questionnaire	6-10
Each Conservation Region chapter lists the habitats in that region and indicates which habitats are the key habitats. These were identified by the experts at the Summit Example: Eastern Tallgrass Prairie Conservation Region	75
Experts at the Summit sometimes identified that adequate information about the key habitats and their relative condition was not available. These concerns were listed as issues and strategies. Example: Tallgrass Prairie Conservation Region: Tallgrass Prairie Habitat	77
Appendix 5: Habitats and Descriptions - this provides a description and location information	144

Detailed description of Key habitats and their relative conditions

Chapter	Page
Conservation Region chapters: Each chapter lists the habitats in that region	75

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and indicates which habitats are the key habitats. These were identified by the experts at the Summit. Example: Tallgrass Prairie Conservation Region	
Conservation Region chapters, Key Habitats: For each key habitat the relative condition is described as well as a listing of strategies (conservation actions) needed for each Key Habitat. Example: Tallgrass Prairie Conservation Region	75

Element 3:
Descriptions of problems which may adversely affect species identified in (1) or their habitats, and priority research and survey efforts needed to identify factors which may assist in restoration and improved conservation of these species and habitats:

General Comment: KDWP chose habitats as the basis for organization of the CWCP. Issues (problems/threats) were identified by using two processes. Existing plans efforts, such as the Kansas Department of Wildlife and Parks Wildlife Diversity Plan, Kansas Central Grasslands All-bird Workshop, Partners in Flight plans, Playa Lakes Joint Venture plans and other were used as a resource. These issues discussed at the Kansas Department of Wildlife and Parks Fish and Wildlife Division meeting, and were reviewed for current applicability and updated where needed. This information was made available to Summit participants to review before the Summit. At the Summit the attendees' identified issues for each of the Key Habitats. Research and surveys are prioritized for each key habitat through the species lists.

Sources of information

Approach: Organization Structure; Public Involvement and Partnership, Coordination with Other Agencies and Tribes	4-6
Methods: Compiling Species List, Defining Habitats and Conservation Regions; Compiling Questionnaire	6-10
Acknowledgements - A diverse list of individuals and organization who were involved	108
Appendix 4: List of Other Related Management Plans	140

Description of threats/problems

Chapter	**Page**
Approach: Organization Structure; Public Involvement and Partnership, Coordination with Other Agencies and Tribes	4-6
Methods: Compiling Species List, Defining Habitats and Conservation Regions; Compiling Questionnaire	6-10
Statewide Perspective: Overall, Statewide Issues and Strategies	14-25
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Relevancy of threats/problems

Chapter	Page
Statewide Perspective: Overall, Statewide Issues and Strategies	14-25
Conservation Region chapters, Key habitats: For each key habitat a list of issues statements (threats/problems) to focus the strategies (conservation actions). Example: Central Mixed Grass Prairie Conservation Region: Herbaceous Wetland Habitat	59-61

Identification of research and survey efforts to obtain needed information.

Chapter	Page
Statewide Perspective: Overall, Statewide Issues and Strategies	14-25
Conservation Region chapters, Key Habitats: If the experts felt there was insufficient information to describe needed issues (threats) research or survey issues were identified. Example: Central Mixed Grass Prairie Conservation Region: Mixed Prairie and Sand Prairie Habitats	53-57

Sufficient description of research and survey needs.

Chapter	Page
Statewide Perspective: Overall, Statewide Issues and Strategies	14-25
Conservation Region Chapters, Key Habitats: Each of the key habitats has issue statements about priority research and survey needs. Example: Central Mixed Grass Prairie Conservation Region: Mixed Prairie and Sand Prairie Habitats	53-57

Element 4:

Descriptions of conservation actions determined to be necessary to conserve the identified species and habitats and priorities for implementing such actions:

General Comment: The strategies presented in this document are conservation actions. The system for prioritizing the implementation of these strategies will be to focus on those that address the highest ranked issue within the highest ranked habitat for any of the Conservation Regions.

Strategies (conservation actions) address issues of habitats

Chapter	Page
Statewide Perspective: Overall, Statewide Issues and Strategies	14-25
Conservation Region Chapters, Key Habitats: Each of the key habitats list strategies (conservation actions) under the prioritized issues (threats). Example: Shortgrass Prairie Conservation Region: Riparian Corridor Complex	44-47

Sufficient guidance to direct implementation at the operational level

Chapter	Page

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Methods: Idenifty Priorities, Issues, Strateties; How to Use This Plan; Adaptive Management and Monitoring.	10-11
Conservation Region Chapters, Key Habitats: Each of the key habitats list strategies (conservation actions) with sufficient detail to guide project development. Example: Shortgrass Prairie Conservation Region: Riparian Corridor Complex	44-47

Method of linking conservation actions to monitoring

Chapter	**Page**
Conservation Region Chapters, Key Habitats: Each of the Key Habitats includes a list of quantifiable monitoring tools/ indicators for monitoring the effectiveness of strategies (conservation actions) and the performance of projects. Example: Shortgrass Prairie Conservation Region: Riparian Corridor Complex	47-48

Federal agencies or regional, national or international partners, and other states as partners

Chapter	**Page**
Methods: Idenifty Priorities, Issues, Strateties; How to Use This Plan; Adaptive Management and Monitoring.	10-11
Statewide Perspective: Overall, Statewide Issues and Strategies	14-25
Conservation Region Chapters, Key Habitats: Many of the key habitats list strategies (conservation actions) other agencies or in partnership. Example: Shortgrass Prairie Conservation Region: Riparian Corridor Complex	44-47

Research or survey needs

Chapter	**Page**
Methods: Idenifty Priorities, Issues, Strateties; How to Use This Plan; Adaptive Management and Monitoring.	10-13
Conservation Region chapters, Key Habitats: If the experts felt there was insufficient information to describe needed strategies (conservation actions) research or survey strategies were identified. Example: Shortgrass Prairie Conservation Region: Herbaceous Wetlands	39-41

Relative priority of conservation actions.

Chapter	**Page**
Methods: Identifying Priorities, Issues, Strategies - describes the prioritization process used and how it will function. Strategies for highest priority issues will have greatest consideration.	10-11
Conservation Region Chapters, Key Habitats: Each of the Key Habitats have the issues (threats) listed in priority order which lists the strategies (conservation actions) in a relative priority order. Although strategies were not prioritized within issues, the implementation approach will be that projects implementing strategies associated with higher ranked issues and habitats will receive first attention. Example: Shortgrass Prairie	39-41

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Conservation Region: Herbaceous Wetlands	

Element 5:

Proposed plans for monitoring species identified in (1) and their habitats, for monitoring the effectiveness of the conservation actions proposed in (4), and for adapting these conservation actions to respond appropriately to new information or changing conditions:

General Comment: Ongoing monitoring will be continued, and new monitoring (inventory and surveys) for Tier I species will be a research priority. Lack of data is a high priority issue for most habitats, so projects for inventory and survey for use in monitoring on habitats would also rank high. Strategies will be modified as needed, through the adaptive management philosophy. Outcomes, while important to evaluation, are not part of the 8 required elements. They can be described as part of adaptive management as we accumulate more data, or on a project-by-project basis during operational planning.

Monitoring species identified in Element #1, and their habitats.

Chapter	**Page**
Methods: Adaptive Management and Monitoring – describes the expectation for project leaders about monitoring the effectiveness of projects.	11-13
Conservation Region Chapters, Key Habitats: Each of the Key Habitats has a listing of quantifiable monitoring techniques; many could be used by agencies to monitor the species and/or habitats identified in this plan. Example: Central Mixed Grass Prairie Conservation Region: Mixed Prairie and Sand Prairie Habitats	57

Monitoring of conservation actions.

Chapter	**Page**
Methods: Adaptive Management and Monitoring - describes the expectation for project leaders	11-13
Conservation Region Chapters, Key Habitats: Each of the Key Habitats has a listing of potential quantifiable monitoring techniques; some could be used by project leaders to monitor the outcomes and the effectiveness of the projects. Example: Central Mixed Grass Prairie Conservation Region: Mixed Prairie and Sand Prairie Habitats	57

If monitoring is not identified for a species or species group, the Strategy explains why it is not appropriate, necessary or possible.

Chapter	**Page**
Methods: Adaptive Management and Monitoring - reference lack of data, and monitoring through updating the plan by replicating the questionnaire, etc.	11-13
This is a habitat focus plan. However, monitoring of species and/or species	65-66

groups is included in the plan. Example: Central Mixed Grass Prairie Conservation Region: Aquatic-Western Lotic Habitat	

Levels of Monitoring.

Chapter	**Page**
Methods: Adaptive Management and Monitoring – describes the expectation that project writers may chose to monitor projects at levels.	11-13
Statewide Perspective: Overall, Statewide Issues and Strategies	14-25
Conservation Region Chapters, Key Habitats: Each of the Key Habitats has a listing of quantifiable monitoring techniques; many could be used by agencies or project leaders to monitor the effectiveness of strategy (conservation action) implementation at several levels. Example: Central Mixed Grass Prairie Conservation Region: Aquatic-Western Lotic Habitat	65-66

How monitoring utilizes existing systems.

Chapter	**Page**
Methods: Adaptive Management and Monitoring – describes the expectation that project leaders may chose to use existing monitoring tools or develop new ones to measure the effectiveness of their projects.	11-13
Statewide Perspective: Overall, Statewide Issues and Strategies	14-25
Conservation Region Chapters, Key Habitats: Each of the Key Habitats has a listing of quantifiable monitoring techniques; project leaders may use one of these or develop new techniques to monitor the effectiveness of strategy (conservation action) implementation. Example: Central Mixed Grass Prairie Conservation Region: Aquatic-Eastern Large Rivers Habitat	72-73
Appendix 4. List of Other Related Management Plans - many include various monitoring techniques that project leaders could utilize.	140

Appropriateness of geographic scale

Chapter	**Page**
Methods: Adaptive Management and Monitoring – describes the expectation that project writers may chose to monitor projects at difference geographic scale	11-13
Statewide Perspective: Overall, Statewide Issues and Strategies	14-25
Ecological Framework	27

Adaptive nature of pl. **Chapter** **Page**

Methods: Adaptive Management and Monitoring – describes the expectation that those involved in the implementation of this plan will allow	11-13

for new strategies (conservation actions).	

Element 6:

Descriptions of procedures to review the Comprehensive Wildlife Conservation Strategy at intervals not to exceed 10 years:

General Comment: KDWP will update the CWCP in 5 years by replicating the questionnaire and a modified process to get input from experts. If limited funding is available, options are to use the Internet, the public forum of Commission meetings, news releases, and e-mail, to name a few. This review should coincide with the regular 5 year review for consideration of changes on the state's threatened and endangered and SINC listings.

Chapter	**Page**
Plan Review and Revision	107

Element 7:

Plans for coordinating, to the extent feasible, the development, implementation, review, and revision of the Comprehensive Wildlife Conservation Strategy with Federal, State, and local agencies and Indian tribes that manage significant land and water areas within the state or administer programs that significantly affect the conservation of identified species and habitats:

Coordination during development.

Chapter	**Page**
Approach: Organization Structure; Public Involvement and Partnership, Coordination with Other Agencies and Tribes	4-6

Commitment for continuing coordination

Chapter	**Page**
Methods: How to Use this Plan: Implementation, the Next Step	11
Plan Review and Revision	107

Element 8:

Provisions to ensure public participation in the development, revision, and implementation of projects and programs. Congress has affirmed that broad public participation is an essential element of this process:

General Comment: Public participation was invited through news releases, email lists of interested parties, email lists of experts, the Summit meeting, exposure through Commission meetings, and access to the plan on the Internet. These same actions will take place for the revision of the plan (with the possible exception of the Summit, depending on available funds). KDWP has and will maintain an open policy on submittal of projects for implementation. The Kansas Nongame Wildlife Advisory Council can play an important role in coordination

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Efforts to date.

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Approach: Organization Structure; Public Involvement and Partnership, Coordination with Other Agencies and Tribes	4-6
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Continuing and future efforts.

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Methods: How to Use this Plan: Implementation, the Next Step	11
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