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## Southern Hills, Pocatello, Idaho: Wildlife Conservation/ Development Study

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**Southern Hills, Pocatello, Idaho:  
Wildlife Conservation/Development Study**

by

**Justin Kmetzsch**

**Thesis submitted in partial fulfillment  
of the requirements for the degree**

of

**HONORS IN UNIVERSITY STUDIES  
WITH DEPARTMENT HONORS**

in

**Landscape Architecture and Environmental Planning**

**Approved:**

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**Thesis/Project Advisor**

CRAIG W. JOHNSON

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Michael Timmons

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**Director of Honors Program**

CHRISTIE FOX

**UTAH STATE UNIVERSITY  
Logan, UT**

**2006**

## Introduction

The sagebrush grassland landscape has shaped aspects of southeastern Idaho culture and enhanced its rural economy. Sharptail grouse, sage grouse and mule deer hunting are deeply rooted in family traditions. Each fall thousands of residents head out into the field to hunt, camp and enjoy the autumn outdoors. Deer hunting and associated activities generate an estimated 240 million dollars annually, in the Idaho economy. More recently, watching and photographing mule deer and other sagebrush grassland species is increasing in popularity and economic significance. But, trends in land conversion and development threaten sagebrush grassland landscapes, the wildlife they sustain, and cultural traditions.

Idaho is among the fastest growing states in the United States. Southern Idaho has experienced growth at an unprecedented rate and projections suggest that significant growth will continue. New development covers valley and foothills fragmenting sagebrush and grassland habitat and displacing wildlife. As a result, Idaho citizens and resource managers are growing increasingly concerned about the future of this important wildlife habitat for a number of biological reasons:

- Approximately 100 bird species and 70 plus mammal and reptile species inhabit sagebrush grassland habitat.
- Populations of more than 50% of sagebrush grassland obligate bird species are in decline.

- Several sagebrush grassland species are either threatened, endangered or like the sage and Columbian sharp-tail grouse, are state species of concern.
- Sagebrush grassland in valley and foothill locations is important big game winter range, which is a limiting resource for many southeastern Idaho deer populations.

In response to declining mule deer populations the Idaho Department of Fish and Game has launched, The Mule Deer Initiative Action Plan: A Roadmap for Success. A significant part of this initiative focuses on conservation of important sagebrush grassland winter range and deer migration corridors, a focus that also conserves non game wildlife species. Locally the city of Pocatello has a stated goal, “encourage the preservation of important wildlife habitat. Protect and maintain significant natural features and other sensitive land within the urban service boundary.” in the 2003 Pocatello Comprehensive Plan. What are the important wildlife habitat conservation issues?

### **Critical Issues**

- Important deer winter range, often on private property is increasingly being converted to development.
- Increased desire for outdoor, nature based non-motorized recreation near residential areas.
- Road and highway proliferation bisects traditional deer migration corridors.
- Declining quality of big game winter range for forage and browsing.
- Disturbance of wildlife on winter range by ATV’s, snowmobiles, free ranging dogs and feral cats.

- Increased predator populations near ex-urban development subsidized by urban garbage and pet food.
- Invasive exotic vegetation which displaces native species and degrade habitat quality.
- Introduction of herbicides and pesticides in natural areas adjacent to development.
- Limited incentive programs and regulatory tools in city and county planning documents designed specifically to address wildlife habitat conservation issues.
- Lack of information about wildlife habitat and other environmental, social and economic values associated with sagebrush grassland landscapes.

## **The Challenge**

The challenge for the Southern Hills Wildlife Conservation/Development Study is to develop a conceptual conservation/development plan and recommendations for the Southern Hills area, site of important sagebrush grassland habitat. The conceptual plan and its recommendations must be:

- Scientifically based and defensible
- Supported in principle by the public
- Balanced between the rights associated with private property and wildlife's right to exist.
- Predictable and understandable by citizens, landowners, resource managers and developers.
- Implement able - with a suite of incentive programs, regulations guidelines, NGO partnerships, government programs and educational materials.

- Prototypical, so that conservation concepts, principles, implementation strategies and recommendations used in the Southern Hills Wildlife Conservation/Development Study can be applied to similar areas in southeastern Idaho.

In summary the long term challenge is to establish and maintain self-sustaining populations of sagebrush grassland dependent wildlife species at levels in dynamic equilibrium with the ecology of the Southern Hills and the social and economic values of the human community in northern Bannock County.

## **Concepts and Principles for Wildlife Conservation**

The concepts and principles below come from the fields of landscape ecology, conservation biology and wildlife management, in particular the work of conservation biologist Michael Soule.

To meet the Southern Hills Wildlife Conservation/Development challenge, Bannock County and the communities within, in collaboration with Idaho department of Fish and Game, must work together to develop consistent complimentary policies, programs and planning and implementation tools that address the issues associated with conservation/development.

Recommendations are based on a review of the scientific literature, review of wildlife conservation sections of other western community planning and zoning documents, the habitat requirements of mule deer and shrub steppe birds, review of existing planning and zoning tools used in the study area and a review of recent community planning and development literature.

Landscape ecologists and conservation biologists have formulated several basic concepts and principles that can be used to guide wildlife planning at the watershed scale. They focus on

the spatial relationships between patches (areas of vegetation that differ from their surroundings), corridors (lineal strips of vegetation that differ from adjacent areas), and the matrix (the animals land use or cover). Developed for regional landscapes and large protected patches (national parks, wildlife refuges, etc.), they are equally effective at smaller scales. Understanding these concepts and principles can help land managers make informed decisions about how best to conserve patches and use corridors to reconnect landscapes that are more functional.

## **Concepts**

Conservation biologists have observed that areas of high conservation value occur as nodes in the landscape. These nodes can exist in varying forms at varying scales - for example: a “champion” tree, a remnant wetland complex, or a county park, national park, forest, or rangeland. The patterns of these nodes and related corridors strongly influence the presence or absence of wildlife species and their use of the landscape.

An ideal pattern for wildlife conservation would preserve important nodes (core reserves), provide corridors (linkages) between nodes, and establish multiple use (buffer zones) around the nodes and corridor. This pattern satisfies wildlife needs and buffers potential adverse impacts originating in the matrix. It also provides opportunities for low-intensity human use of the buffer zones around the reserves.

## **Principles**

### ***Patches***

- Large reserves/patches are better than small reserves/patches.
- Connected reserves/patches are better than separated reserves/patches.

- Unified reserves/patches are better than fragmented reserves/patches.
- Several reserves/patches (redundancy) are better than one reserve/patch.
- Nearness among patches is better than separation.

### *Corridors*

- Continuous corridors are better than fragmented corridors.
- Wider corridors are better than narrow corridors.
- Natural connectivity should be maintained or restored.
- Introduced connectivity should be studied carefully.
- Two or more corridor connections between patches (redundancy) are better than one.

### *Matrix*

- Manage the matrix with wildlife in mind.

### *Structure*

- Structurally diverse corridors and patches of native vegetation are better than simple structure.

## **Recommendations**

### **Regional and County Scale**

- Consider implementing a moratorium on any new subdivision development in areas designated important big game winter range effective until a conservation plan and implementation tools are in place.
- Prioritize big game winter range and movement corridors in Bannock County based on an assessment of big game use, habitat quality and risk of development.



- Develop a conservation plan for important big game habitat for the county and communities within it. (Other non game species and native plants will also benefit)
- Design an implementation strategy and approve a suite of planning tools that specifically address big game habitat conservation while permitting responsible development.

Tools may include but are not limited to:

- Land acquisition
  - Transferable development rights
  - Conservation easements
  - Planned unit development, multiple use districts and/or clustering options
- Develop regulations to manage pedestrian, equestrian, ATV and snowmobile access to important winter range during the winter months.
  - Identify potential planning and funding partners for the conservation of important winter range. e.g. Rocky Mountain Elk Foundation, sportsperson groups, Trust for Public Lands, NRCS, federal land management agencies, and others.
  - Identify public and private funding sources for acquisition of property or conservation easements.
  - Prepare for sagebrush grassland habitat, specific wildlife conservation educational materials for developers and home owners and conduct workshops on the important winter range conservation plan, important area zoning, and subdivision standards, alternatives to development, mitigation options and habitat stewardships.

- Form an umbrella conservation organization, e.g. “Friends of the Foothills”, a clearing house to assist in coordinating public and private habitat conservation activities into the future.

### **Project Scale**

- Require plan submissions in areas designated as important big game winter range that at a minimum delineate:
  - Important big game winter range and migration corridors
  - Slopes > 25% and < 10%
  - South and west slopes, aspects
  - Fault lines, unstable soils, landslide prone areas and other natural hazards
  - Existing drainage channels
  - Floodplains
  - Wetlands
  - Perennial and ephemeral streams
  - Springs
  - Threatened or endangered wildlife and plant species habitat or location(s).
- Concentrate development outside areas designated big game winter range.
- Concentrate development on slopes <10%.
- Cluster housing.
- Minimize road density and road widths.
- Prohibit building on slopes >25%.
- Minimize disturbance to natural vegetation – avoid mass grading.

- Require on-site management of storm water – preserve natural drainages.
- Require setbacks for perennial and ephemeral streams, minimum 70' from mean high water mark plus 35' or 100' or top of stream bank slope plus 35' which ever is greater. For floodplains, springs and wetlands specify a 35' minimum buffer width.
- Develop a program to control noxious weeds.

### **Residential Scale**

- Minimize fencing of properties, where it is necessary use design standards recommended by IDFG.
- Prohibit feeding of big game
- Secure all garbage and pet food
- Require pets to be confined or under owner control.
- Prohibit open burning and fireworks
- Recommend fire resistant building materials for structures.
- Apply fire safe landscaping principles when developing landscape plans.
- Plant landscape with sagebrush grassland native species and/or adopted drought tolerant plants.
- Prepare habitat and wildlife conservation (stewardship) education materials for residents on foothill developments.

## **Implementation**

Strategies for implementing an integrated county/community big game habitat conservation plan will depend on public support, political will, land owner participation, conservation partnerships, governmental assistance, zoning, volunteerism and education.

Implementation options include but are not limited to:

- Land acquisition
- Conservation easements
- Transferable development rights/ multiple use districts
- Zoning
- Subdivision regulations specific to important habitat overlay zones
- Land exchange options
- Density bonuses
- Zoning and subdivision regulations specific to important winter range areas
- Impact fees
- Mitigation
- Replacement in-kind
- Equivalent replacement
- In-kind or equivalent/enhancement option
- Payment in lieu of replacement
- Volunteers

Achieving a sustainable environmental future in the region will require a balanced approach to implementation, one that acknowledges the rights and responsibilities of land ownership and the need to protect important big game winter range and the associated non-game species that inhabit it. Conserving big game winter range also conserves habitat for other sagebrush grassland species. In addition protecting sagebrush grassland conservations preserves the regions aesthetic character and affords opportunities for hiking trails and other associated passive recreation in the summer months.

“In short, a land ethic changes the role of homo sapiens from conqueror of the land – community to plain member and citizen of it. It implies respect for his/her fellow-members and also respect for the community as such.”

Aldo Leopold

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# Introduction



Southern Hills, Pocatello, Idaho

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Bannock County Big Game Habitat

Idaho is among the fastest growing states in the United States. Southern Idaho has experienced growth at an unprecedented rate and projections suggest that significant growth will continue. New development covers valleys and foothills fragmenting sagebrush and grassland habitat and displacing wildlife. As a result, Idaho citizens and resource managers are growing increasingly concerned about the future of this important wildlife habitat for a number of biological reasons:

- Approximately 100 bird species and 70 plus mammal and reptile species inhabit sagebrush grassland habitat.
- Populations of more than 50% of sagebrush grassland obligate bird species are in decline.
- Several sagebrush grassland species are either threatened, endangered or like the sage and Columbian sharptail grouse, are state species of concern.
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## Critical Issues

- Important deer winter range, often on private property is increasingly being converted to development.
- Increased desire for outdoor, nature based non-motorized recreation near residential areas.
- Road and highway proliferation bisects traditional deer migration corridors.
- Declining quality of big game winter range for forage and browsing.
- Disturbance of wildlife on winter range by ATV's, snowmobiles, free ranging dogs and feral cats.
- Increased predator populations near suburban development subsidized by urban garbage and pet food.
- Invasive exotic vegetation which displaces native species and degrades habitat quality.
- Introduction of herbicides and pesticides in natural areas adjacent to development.
- Limited incentive programs and regulatory tools in city and county planning documents designed specifically to address wildlife habitat conservation issues.
- Lack of information about wildlife habitat and other environmental, social and economic values associated with sagebrush grassland landscapes.



Pocatello Area Mule Deer Habitat



Pocatello Area Mule Deer Habitat At Risk



mule deer



western tanager



sharptail grouse



cottontail rabbit



coyote



## Southern Hills Pocatello, Idaho

Wildlife Conservation/Development Study 2006

Utah State UNIVERSITY



Senior Honors Project by Justin Knetzsch & Prof. Craig Johnson  
Department of Landscape Architecture and Environmental Planning





# Concepts and Principles for Wildlife Conservation

## The Challenge

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- Scientifically based and defensible
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In summary, the long term challenge is to establish and maintain self-sustaining populations of sagebrush grassland dependent wildlife species at levels in dynamic equilibrium with the ecology of the Southern Hills and the social and economic values of the human community in northern Bannock County.

To meet the Southern Hills Wildlife Conservation/Development challenge, Bannock County and the communities within, in collaboration with Idaho department of Fish and Game, must work together to develop consistent complimentary policies, programs and planning and implementation tools that address the issues associated with conservation/development.

Landscape ecologists and conservation biologists have formulated several basic concepts and principles that can be used to guide wildlife planning at the watershed scale. They focus on the spatial relationships between patches (areas that differ from their surroundings), corridors (lineal features that differ from their surroundings), and the matrix (the dominant land cover type). Developed for regional landscapes and large protected patches (national parks, wildlife refuges, etc.), they are equally effective at smaller scales. Understanding these concepts and principles can help land managers make informed decisions about how best to use corridors to recreate landscapes that are more functional.

The concepts and principles to the right come from the fields of landscape ecology, conservation biology and wildlife management in particular the work of conservation biologist Michael Soule.

## Concepts

Conservation biologists have observed that areas of high conservation value occur as nodes in the landscape. These nodes can exist in varying forms at varying scales - for example: a "champion" tree, a remnant wetland complex, or a county park, national park, forest, or rangeland. The patterns of these nodes and related corridors strongly influence the presence or absence of wildlife species and their use of the landscape.

An ideal pattern for wildlife conservation would preserve important nodes (core reserves), provide corridors (linkages) between nodes, and establish multiple use (buffer zones) around the nodes and corridor. This pattern satisfies wildlife needs and buffers potential adverse impacts originating in the matrix. It also provides opportunities for low-intensity human use of the buffer zones around the reserves.

## Principles

### Patches

Large reserves/patches are better than small reserves/patches.



Connected reserves/patches are better than separated reserves/patches.



Unified reserves/patches are better than fragmented reserves/patches.



Several reserves/patches (redundancy) are better than one reserve/patch.



Nearness is better than separation.



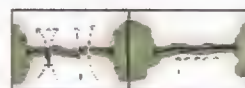
### Matrix

Manage the matrix with wildlife in mind.



### Corridors

Continuous corridors are better than fragmented corridors.



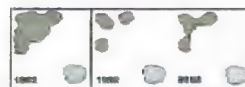
Wider corridors are better than narrow corridors.



Natural connectivity should be maintained or restored.



Introduced connectivity should be studied carefully.



Two or more corridor connections between patches (redundancy) are better than one.



### Structure

Structurally diverse corridors and patches are better than simple structure.



## Quality

The composition of vegetation in winter range patches is critical. A patch composed of a diversity of native plants is quality habitat, a patch of decadent sagebrush and cheat grass is not.



## Southern Hills Pocatello, Idaho

Wildlife Conservation/Development Study 2006

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# Recommendations

Recommendations are based on a review of the scientific literature, review of wildlife conservation sections of other western community planning and zoning documents, the habitat requirements of mule deer and shrub steppe birds, review of existing planning and zoning tools used in the study area and a review of recent community planning and development literature.

## Regional & County scale

- Consider implementing a moratorium on any new subdivision development in areas designated important big game winter range effective until a conservation plan and implementation tools are in place.
- Prioritize big game winter range and movement corridors in Bannock County based on an assessment of big game use, habitat quality and risk of development.
- Develop a conservation plan for important big game habitat for the county and communities within it. (Other non game species and native plants will also benefit)
- Design an implementation strategy and approve a suite of planning tools that specifically address big game habitat conservation while permitting responsible development.

Tools may include but are not limited to:

- Land acquisition
- Transferable development rights
- Conservation easements
- Planned unit development, multiple use districts and/or clustering options
- Develop regulations to manage pedestrian, equestrian, ATV and snowmobile access to important winter range during the winter months.
- Identify potential planning and funding partners for the conservation of important winter range. e.g. Rocky Mountain Elk Foundation, sportsperson groups, Trust for Public Lands, NRCS, federal land management agencies, and others.
- Identify public and private funding sources for acquisition of property or conservation easements.
- Prepare sagebrush grassland habitat, specific wildlife conservation educational materials for developers and home owners.
- Conduct workshops on the importance of winter range conservation plans, critical area zoning, and subdivision standards, alternatives to development, mitigation options and habitat stewardships.
- Form an umbrella conservation organization, e.g. "Friends of the Foothills", a clearing house to assist in coordinating public and private habitat conservation activities into the future.

## Project scale

- Require plan submissions in areas designated as important big game winter range that at a minimum delineate:
  - Important big game winter range and migration corridors
  - Slopes > 25% and < 10%
  - South and west slope, aspects
  - Fault lines, unstable soils, landslide prone areas and other natural hazards
  - Existing drainage channels

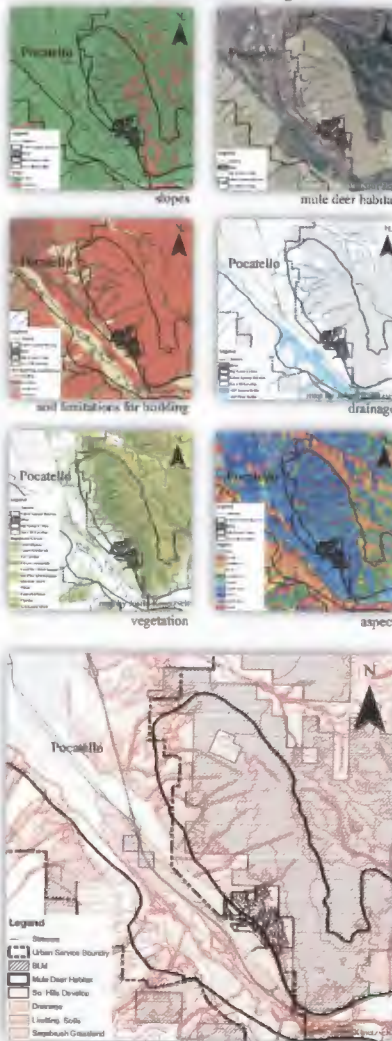
- Floodplains
- Wetlands
- Perennial and ephemeral streams
- Springs
- Threatened or endangered wildlife and plant species habitat or location(s).
- Concentrate development outside areas designated big game winter range.
- Concentrate development on slopes <10%.
- Cluster housing.
- Minimize road density and road widths.
- Prohibit building on slopes >25%.
- Minimize disturbance to natural vegetation – avoid mass grading.
- Require on-site management of storm water – preserve natural drainages.
- Require setbacks for perennial and ephemeral streams, minimum 70' from mean high water mark plus 35' or 100' which ever is greater, for floodplains, springs and wetlands
- 35' minimum buffer width from landward edge.

## Residential scale

- Minimize fencing of properties, where it is necessary use design standards recommended by IDFG.
- Prohibit feeding of big game
- Secure all garbage and pet food
- Require pets to be confined or under owner control.
- Prohibit open burning and fireworks
- Recommend fire resistant building materials for structures.
- Apply fire safe landscaping principles when developing landscape plans.
- Plant landscape with sagebrush grassland native species and/or adapted drought tolerant plants.
- Prepare habitat and wildlife conservation (stewardship) education materials for residents on foothill developments.

## Southern Hills Environmental Assessment

### Limitations to Building



Composite of Building Limitations

## Design Clients



# Southern Hills Pocatello, Idaho

Wildlife Conservation/Development Study 2006



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Department of Landscape Architecture and Environmental Planning



# Implementation

Strategies for implementing an integrated county/community big game habitat conservation plan will depend on public support, political will, land owner participation, conservation partnerships, governmental assistance, zoning, volunteerism and education.

Implementation options include but are not limited to:

- Land acquisition
- Conservation easements
- Transferable development rights
- Zoning
- Subdivision regulations specific to critical habitat overlay zones
- Land exchange options
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- Zoning and subdivision regulations specific to critical winter range areas
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Achieving a sustainable environmental future in the region will require a balanced approach to implementation, one that acknowledges the rights and responsibilities of land ownership and the need to protect important big game winter range and the associated non-game species that inhabit it. Conserving big game winter range also conserves habitat for other sagebrush grassland species. In addition protecting sagebrush grassland conservations preserves the regions aesthetic character and affords opportunities for hiking trails and other associated passive recreation in the summer months.

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Aldo Leopold

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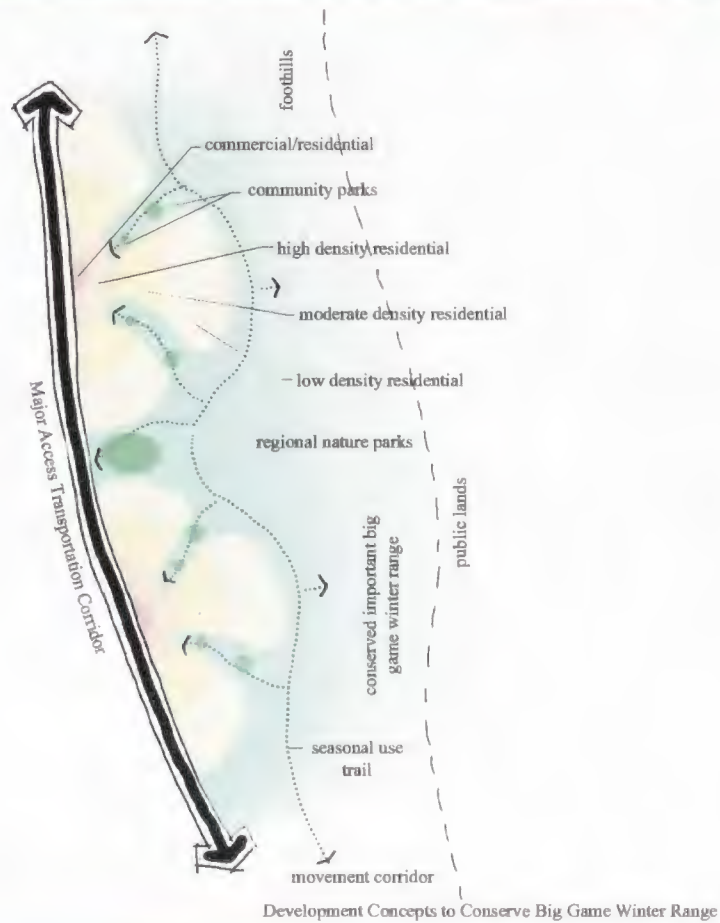
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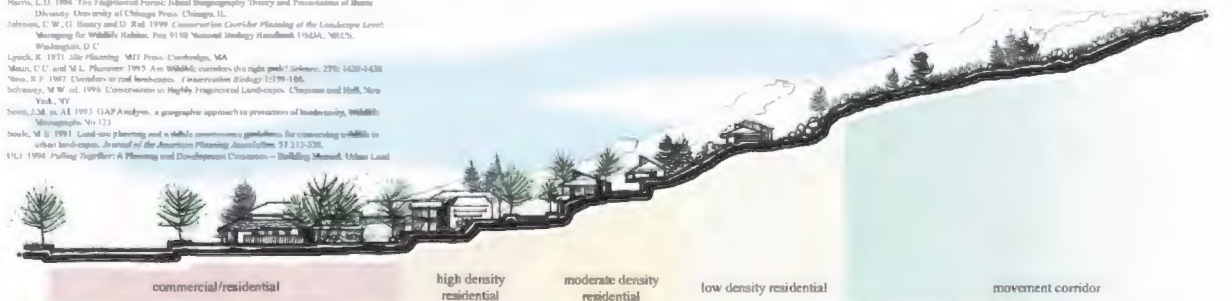
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## Development Concept



Development Concepts to Conserve Big Game Winter Range



Cross Section of Development Concept



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