

BIGHORN WILDLAND



ALBERTA WILDERNESS ASSOCIATION

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Any use of the terms *hel/him* and *man/men* are not meant to exclude the female gender and are used generically to refer to humankind. *Aboriginal* and *First Nations* are terms used to describe indigenous peoples both from the distant past and those living

in the area today. Place names used throughout are those of common usage and most are of European origin. AWA understands that the Stoney Nation is assembling a list of aboriginal place names for the area, but these are not yet available.

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BIGHORN WILDLAND

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ALBERTA WILDERNESS ASSOCIATION
BIGHORN WILDLAND



Defending Wild Alberta through Awareness and Action

Alberta Wilderness Association is the oldest wilderness conservation group in Alberta dedicated to the completion of a protected areas network and the conservation of wilderness throughout the province. Formed in 1965 in rural southwest Alberta by backcountry enthusiasts, ranchers and outfitters, AWA has grown to include a wide diversity of backgrounds and skills in its membership. With almost four decades of successes, it is known for its tenacity, memory and integrity. It is a non-profit, federally registered, charitable society with a great deal of its work being carried out by volunteers. AWA's mission is to defend wild Alberta through awareness and action. Through this book we invite you to explore one of Alberta's last pristine big wilderness areas and join us in standing up for its protection. It is our goal that one day our children's children will see the Bighorn as we do, in all its wild splendour.



ACKNOWLEDGEMENTS

Alberta Wilderness Association (AWA) appreciates the vision and dedication of Vivian Pharis in completing this book. Writing a book about this magnificent wilderness has been her dream for many years. Vivian guided the book through its early drafts and was the primary contact with chapter contributors. She wrote several chapters and assisted in the early editing of contributed pieces. Dorothy Dickson lent her expertise as an editor for many of the chapters, and Peter Sherrington did the first critical read-through and edit of the entire manuscript. Dr. Herb Kariel and Pat Jackson were consultants and their material regarding landmarks, geography and the area's climate was incorporated throughout. AWA staff coordinated development of the maps, proofread, edited subsequent versions of the manuscript, researched elements of the book and tirelessly completed final revisions and edits.

Joyce Hildebrand capably ushered the book through its final edit. The Association recognizes the many contributors who so willingly and supportively gave of their personal time and made this vision a reality.

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Roger Macqueen thanks Margot McMechan, Vivian Pharis, Dave Sargent and Glen Stockmal for useful suggestions on revision of his paper; Vivian and Richard Pharis, who supplied most of

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Elaine Gordon thanks Vivian Pharis for her inspiration and beautiful photographs, John Rintoul of the Alberta Natural Heritage Information Centre for plant information, and her husband, Don Gordon, for his helpful suggestions. Also special thanks to Joyce Gould for her expertise and for providing the exceptional photograph of the Lapland rosebay.

TABLE OF CONTENTS

INTRODUCTION ————— 1	CHAPTER 7 ————— 52	CHAPTER 15 ————— 118
CHAPTER 1 ————— 2	CORAL CREEK-JOB CREEK	FIRST NATIONS
BIGHORN WILDLAND	Vivian Pharis	Andy Marshall
Vivian Pharis	CHAPTER 8 ————— 60	CHAPTER 16 ————— 126
BIGHORN MAPS ————— 8	CLINE RIVER	EARLY EXPLORATION
CHAPTER 2 ————— 14	Vivian Pharis	Joyce McCart
CONSERVATION MILESTONES	CHAPTER 9 ————— 66	CHAPTER 17 ————— 134
Tamaini Snaith	KOOTENAY PLAINS	OUTFITTERS
History of Eastern Slopes Watershed Protection	ECOLOGICAL RESERVE	Vivian Pharis
by Vivian Pharis and Robert Stevenson	Dorothy Dickson and Julia Cook	Early Forest Rangers
CHAPTER 3 ————— 22	CHAPTER 10 ————— 72	by Robert Stevenson
PANTHER CORNERS	SIFFLEUR WILDERNESS	CHAPTER 18 ————— 144
Vivian Pharis	Don Wales	THE VALUE OF WILD PLACES
CHAPTER 4 ————— 30	CHAPTER 11 ————— 76	Philip Clement and Alan Ernst
UPPER CLEARWATER	WHITE GOAT WILDERNESS	Wilderness Ethics by Don Wales
Vivian Pharis	Don Wales	GLOSSARY & REFERENCES — 152
Importance of Wetlands and Watersheds	CHAPTER 12 ————— 82	PHOTO CREDITS ————— 158
by Heinz Unger	GEOLOGY & EXPLORATION	AUTHORS' BIOGRAPHIES — 159
CHAPTER 5 ————— 36	Dr. Roger Macqueen	
RAM HEADWATERS	CHAPTER 13 ————— 94	
Vivian Pharis	PLANTS OF THE BIGHORN	
CHAPTER 6 ————— 44	Elaine Gordon	
WAPIABI-BLACKSTONE-SUNKAY	CHAPTER 14 ————— 104	
Vivian Pharis	WILDLIFE OF THE BIGHORN	
	Dr. Luigi Morgantini	
	Birds by Rod Burns - Fish Community by Ken Zelt	

INTRODUCTION



Since the early 1970s I have been keenly aware of the treasure we have so close at hand in the unspoiled, wild and beautiful Bighorn Wildland. This is, perhaps, because I have had the privilege of experiencing wilderness in other parts of the world both similar and vastly different from Alberta's Eastern Slopes Rockies. My travels abroad suggest that in other countries this magnificent piece of wilderness would be recognized for its natural values and therefore coveted and protected. The words of American wilderness writer Michael Frome, in his book *Battle for Wilderness*, express some of the frustration I feel over the lack of official interest in and understanding of the value of Alberta's wilderness: "How much wilderness does it take to fulfill the needs of civilization? That really isn't the key question. What counts more is whether each

succeeding generation must settle for an increasingly degraded world and know the experience of the past from books and pictures only. Must the future be satisfied with mediocrity because nothing better will be known?"

For more than thirty years Alberta Wilderness Association (AWA), other conservation groups, area outfitters and many members of the general public have fought for legislated protection of the Bighorn Wildland. They have worked for many years with the government in order to fulfill this dream. Despite sustained, scientifically sound and eloquent oral and written representations, our wish to have this exceptionally special place afforded real protection has not been achieved. Recent decisions legally open much of the Bighorn Wildland to off-

road vehicle and helicopter-assisted recreation, and there is increasing pressure to develop its petroleum reserves. In addition, there have been recent increases in drilling, logging and off-road vehicle recreation just outside its boundaries. All of this makes the ecological integrity of the area increasingly precarious. Will the Bighorn's future be one of continued splendour or of degradation?

This book has been designed and written to tell the story of the Bighorn Wildland. It is also an invitation to become more personally involved in its destiny. I hope that this book will create an impetus for action on behalf of the Bighorn so that future generations will be able to experience it as we do now.

Vivian Pharis

BIGHORN WILDLAND



1

VIVIAN PHARIS

BIGHORN WILDLAND



Nestled along the Eastern Slopes of Alberta's Rocky Mountains lie 4000 sq km of superb wilderness. The magnificent sweeping vistas encompass wildflower meadows, lush forested valleys and grassy ridges that contrast dramatically with snow-covered mountains. These wildlands are home to a rich tapestry of life. Wild horses roam freely with elk, bighorn sheep and grizzly bears; wolves call across wide valleys, harlequin ducks float down pristine streams and eagles hunt along the ridges.

Within such a large landscape animal life can be elusive to the casual visitor, but the Bighorn will reveal its secrets to those with patience.



This stretch of the Brazeau River near Longview Lake would not be a safe choice for fording with horses, but several kilometers below and above, broad, shallow, hard-bottomed fords can be found.

THE BIGHORN

Lying on an approximate northwest-southeast axis, the Bighorn Wildland parallels the Continental Divide, or main range, of the Rocky Mountains. It is about 155 km long and 55 km wide, extending between the Red Deer River in the south and the Brazeau River in the north. The North Forestry Road lies to the east and Highway 11, the David Thompson Highway, bisects the area along a northeast-southwest diagonal. Almost the entire area of the Bighorn is within the North Saskatchewan drainage, with the exception of southern reaches that drain into the Red Deer River, a main artery of the South Saskatchewan River system. The area fits neatly, like a missing jigsaw puzzle piece, into a gap of protected national parks lands, just where Banff and Jasper Parks abut. In fact, much of the Bighorn Wildland

was once included in the national parks and is an ecologically logical addition to a protected areas system along the Eastern Slopes that includes both provincial and federal lands. Almost a hundred years ago the watersheds of the Eastern Slopes were recognized for their importance as the source of water for the prairies. The Bighorn area was central to this conservation vision.

The Bighorn, Ram and Front Ranges, and their associated foothills, constitute the landscape of the Bighorn Wildland. It is the complexity of the Bighorn's geology that produces the magnificent scenery of the region. In Chapter 12, Dr. Roger Macqueen, an emeritus scientist with Canada's Geological Survey, leads readers on a fascinating geological expedition through the Bighorn Wildland, discussing the hundreds of millions of years that it has taken to form the landscapes that we see today. The glaciers that have retreated only in the past few thousand years have left behind highly sculpted vistas. We are perhaps glimpsing places like the Bighorn Wildland at the peak of their aesthetic perfection, before erosion fills in and wears away the distinct features that so please our eye and test our mettle.

When Europeans came to the Bighorn Wildland, they named the more outstanding peaks. The highest point in the Bighorn Range itself is 2556 metres, but most of the higher peaks lie along the western border with the national parks. Mount Cline, at 3361 metres, is the highest peak in the Bighorn. Other outstanding peaks that are around 3000 metres include Obstruction Mountain near Job Creek; Cline, Resolute and the White Goat Peaks in the Cline River area; Mounts Siffleur, Loudon, Dolomite and Kentigren in the Siffleur Wilderness Area; Mounts McDonald and Stewart and Cirrus Mountain in the White Goat

Wilderness Area; and Candor Peak, Tomahawk, Wapiti, Warden Rock, Barrier and Dormer Mountains in the vicinity of the Upper Clearwater, Red Deer and Panther Rivers. These peaks are the pinnacles in the backdrop that forms many of the Bighorn's western views, and they have drawn mountaineers to the area for more than a hundred years.

As with mountainous terrain everywhere, visitors to the Bighorn Wildland should be prepared for changeable and extreme conditions even during the most benign months of July, August and September. In summer, days can be warm, with temperatures sometimes reaching over 30° C, and night temperatures usually remain above freezing. The frost-free season is only about 60 days. Snow can be expected in every month of the year and winter temperatures may fall to -40° C. As a result of aspect and elevation, a wide range of microclimates are created in the mountains and foothills. This partially accounts for the wondrous variety of plant and animal communities found throughout the area. The eastern, drier part of the Bighorn receives most of its precipitation (around 450 mm) in the summer as rain, whereas the western, more mountainous part receives most of its moisture (around 735 mm) in the winter as snow.

Two authors tell us about the wildlife and plants that are as much a part of the Bighorn as are its landscapes. Dr. Luigi Morgantini has studied bighorn sheep, elk and caribou on the Eastern Slopes extensively and gives us a dynamic account of the lives of the Bighorn's animals. Stories of the return of the elk from near extinction, the mysteries of the "gray ghosts" of the Bighorn, and its "white buffalo" and extinct bison are told. He shows how the Bighorn provides essential winter habitat for much of the adjacent national parks' wildlife and how the parks are summer habitat for herds that wander without knowledge of

boundaries. The Bighorn and the national parks share a common ecological heritage and future.

Edmonton botanist and author Elaine Gordon paints a compelling picture of the plants that thrive in this beautiful but harsh wilderness. She reveals some of the secrets about why the alpine wallflower and nodding pink thrive on blasted talus slopes, where to find the rare alpine poppy and exotic Lapland rosebay, and why the edge of timberline dissolves into gnarled krummholz colonies.

We don't know who were the first peoples to know the lands we call the Bighorn Wildland, but likely the wildlife and relatively mild microclimates have drawn peoples to the area since the ice retreated about 10,000 years ago. Archaeological digs in the vicinity of the Ya Ha Tinda Ranch in the upper Red Deer River valley and a survey of the Kootenay Plains prior to their flooding in 1978 indicates long and continuous use of both areas. Well-known writer Andy Marshall's chapter on First Nations shows us that while the Wesley Band of the Stoney Nation occupies the area today, the earliest known nomadic peoples in the Bighorn were the Kootenay, probable summer migrants from British Columbia. When David Thompson arrived to trade fur in the late 1700s, the Kootenay, Peigan and Blackfoot were all in the area. In the last two centuries, many different native tribes and nations have been drawn to the wide valleys within the Bighorn.

Historian and author Joyce McCart has summarized the impressions of the first four Europeans who explored the Bighorn and kept diaries of their travels. David Thompson was one of the first Europeans to live in and write about the land. He was sent to the area in the late 1700s by the North West Company to establish a fur trade.



Stewardship has been part of AWA's Bighorn agenda since 1972 when Pinto Lake was first cleaned. From 1984 to 1994, trails and camps were cleared of garbage, and campsites were posted with handmade signs. Some of these remain in place to this day.



Near Elliot Peak, on the David Thompson Highway, an early snowfall catches Abraham Lake before freeze-up.

In 1807, after establishing a trading post at Rocky Mountain House, Thompson, an inexhaustible explorer, fought his way by horse and canoe through deadfall and floods to the Kootenay Plains and then across the Howse Pass to briefly establish a new trading area in British Columbia.

After David Thompson, half a century passed before other notable explorers, like James Hector and James Carnegie, ventured into the area and recorded their decidedly different impressions. American adventurer and diarist Mary Schäffer visited the area three times between 1905 and 1907. On her final visit, Mary wrote forebodingly of the impending loss of this wilderness and the way of life of resident peoples.

Mary's words were still echoing amongst the cliffs when early guides and outfitters like Tom Wilson and Jim Simpson began including the Bighorn in their commercial operations. Around the 1920s, guiding wilderness seekers, hunters and fishermen into the Bighorn became a livelihood for a number of hardy families, some of which have continued in the business for two or three generations, until the present. Vivian Pharis interviewed two pioneering guide and outfitter families, the Sands and the McKenzies. The stories of their escapades in some of the most stunning country in the world, sometimes in truly adverse conditions, of their tough determination to make their livelihoods where few would have the stamina, shows how undaunted the human spirit can be when the land and a way of life are held as precious.

In this magnificent wilderness, there remain many places where it is still possible to escape entirely from life's hectic pace and taste the wild frontier that was common fare for adventurers only a hundred years ago. Vivian Pharis, Don Wales,

Dorothy Dickson and Julie Cook, all of whom have intimate knowledge of the Bighorn, have written the nine chapters that describe the area from a traveller's perspective. Don Wales has travelled in parts of the Bighorn Wildland, including the White Goat and Siffleur Wilderness Areas, in summer and winter, by foot and by ski. Dorothy Dickson has seen many of the Bighorn's trails from the back of a horse, and Julie Cook has been privileged to live several summers on or near the Kootenay Plains. Vivian Pharis and her husband, Richard, have trekked and photographed throughout the Bighorn since the early 1970s.

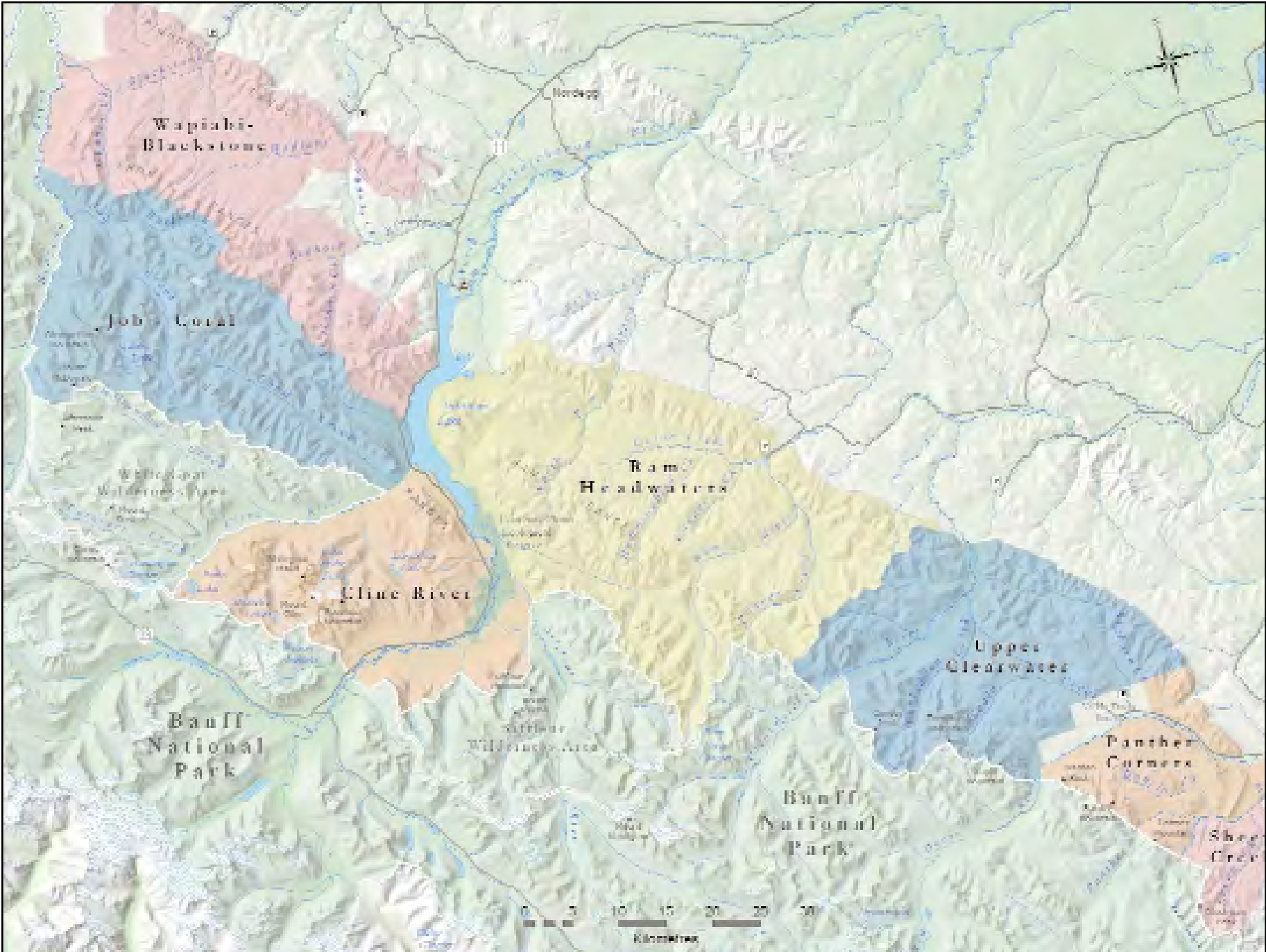
Join them now as they travel through these areas. We hope that you become inspired to become a defender of the Bighorn and perhaps use this book for planning your own adventures.

Clamshells fossilized in limestone hold secrets of geological time.

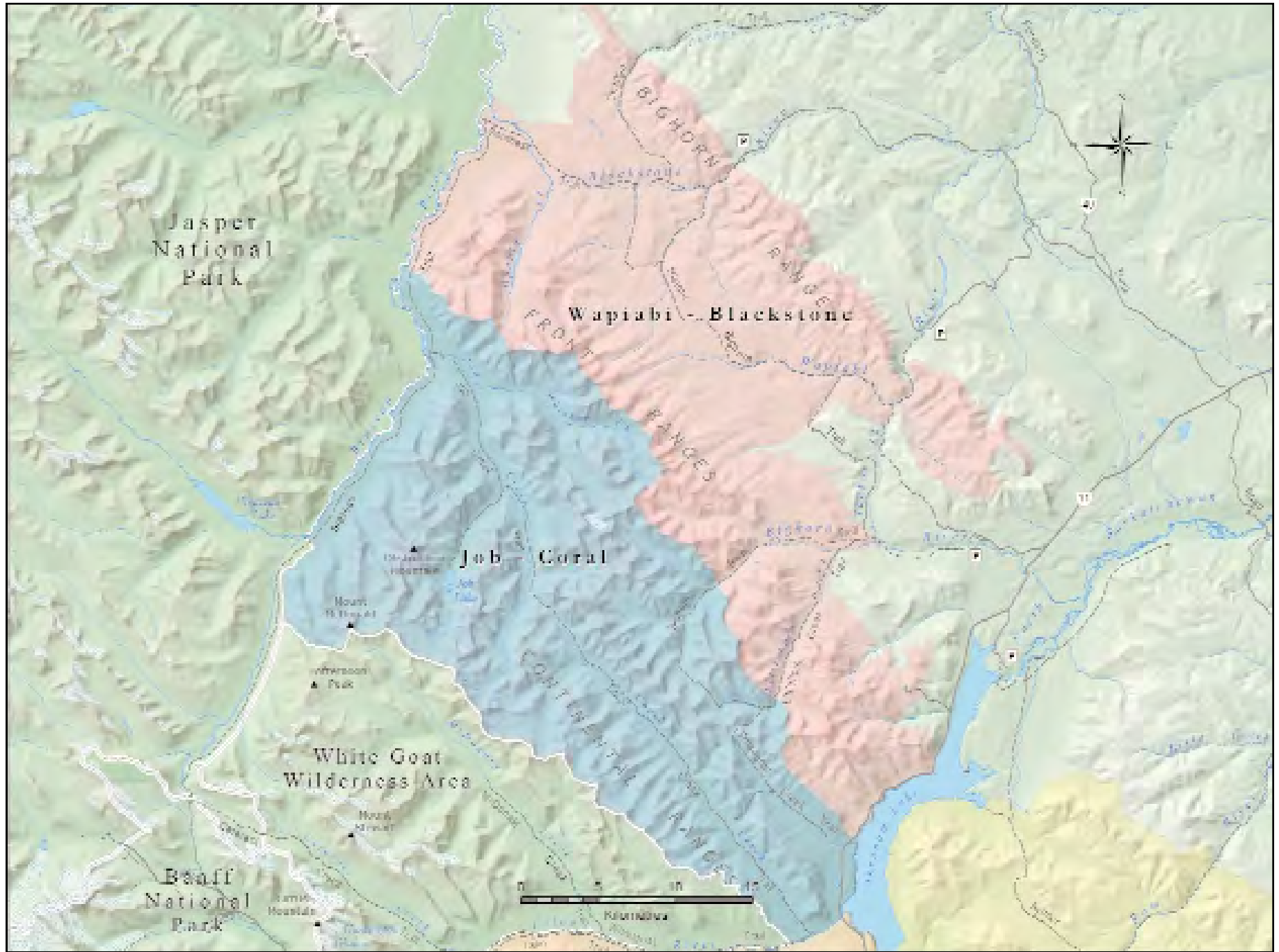


MAPS OF THE BIGHORN





THE BIGHORN WILDLAND



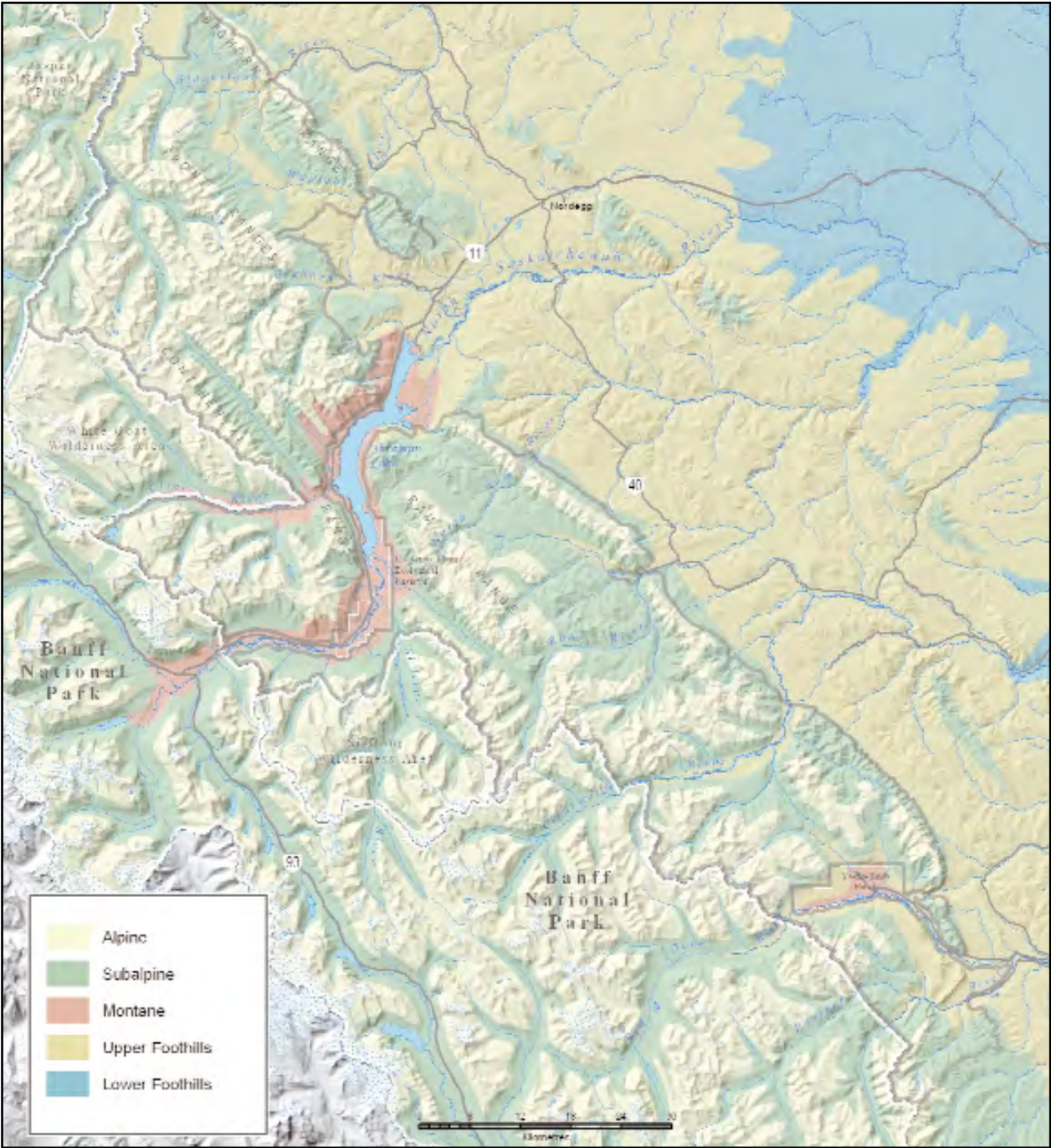
WAPIABI - BLACKSTONE - JOB - CORAL



CLINE RIVER - RAM HEADWATERS



UPPER CLEARWATER - PANTHER CORNERS - SHEEP CREEK



NATURAL REGIONS OF THE BIGHORN

CONSERVATION MILESTONES



2

TAMAINI SNAITH

CONSERVATION MILESTONES



Alberta is currently experiencing economic growth at an unprecedented rate.

A large portion of our public land has been affected by forestry, oil and gas extraction, mining, farming and urban development. As a result, Alberta's wilderness is increasingly threatened by the degradation of natural ecosystems and the loss of biodiversity. Conservation biology provides evidence that current protected areas are not sufficient for the long-term maintenance of biodiversity and local wildlife populations. We need more protected areas, and they need to be bigger, more connected and surrounded by appropriate transition zones where compatible activities occur.

We are running out of opportunities to protect nature. As a large, unroaded and relatively pristine wilderness, the Bighorn has tremendous value for wildlife, water and backcountry recreation. To protect these values, we must keep this area free from further human disturbance.



Willow species like this Salix barrattiana with its startlingly large catkins are common throughout the Bighorn.

CONSERVATION MILESTONES

In 1986 the government of Alberta announced the naming of the Bighorn Wildland Recreation Area. This designation was a step toward fulfilling a 1975 government promise to protect at least 70 per cent of the Eastern Slopes in “a natural or wilderness state.” Although the area has never been protected by legislation, the Wildland has been reinforced over the years by a number of government commitments, maps and publications. However, in 2001 the government of Alberta began to erode protection for the area by removing it from official maps, announcing its non-existence and initiating an access management process that would undermine protective land-use policies. In the fall of 2002, the government legalized the use of motorized recreational vehicles in the area and failed to provide meaningful protection from industrial development.

The future of the Bighorn is uncertain, as competing interests vie for access. A number of large Canadian and American oil companies have bought subsurface leases and will likely want to explore for sour gas; forest companies operate in adjacent areas; off-road vehicle (ORV) and snowmobile clubs are lobbying for more trails; and environmental groups continue to demand protection for the Wildland.

HISTORY

In the 1970s and 1980s, the government of Alberta initiated regional zoning efforts to plan for appropriate resource allocation and the resolution of land-use conflicts. The Eastern Slopes Policy was created at a regional scale and was based on extensive public consultation. The highest priority was placed on watershed protection, and the policy declared that resource management must be consistent with conservation and environmental protection. The Eastern Slopes Policy provided the basis for more detailed, local Integrated Resource Plans (IRPs).

Due to the high conservation value and environmental sensitivity of the Bighorn, both the Eastern Slopes Policy and the local IRP placed much of the region under the most protective category: the Prime Protection Zone. According to the Policy and the IRP, the intent of this designation is “to preserve environmentally sensitive terrain and valuable aesthetic resources.” Non-motorized backcountry recreation is encouraged in the Prime Protection Zone, but more intense uses such as industrial development, logging and motorized recreation are prohibited. Adjacent areas were designated as Critical Wildlife Zones, “to protect specific fish and wildlife populations by protecting ... habitat,” and Multiple Use Zones, where more intense human use could be accommodated.

Following the creation of these policies, the government announced the creation of the Bighorn Wildland. The Wildland would formally protect the Prime Protection Zones and a small portion of Critical Wildlife Zone. However, the government failed to provide legislation for the area, leaving the Bighorn vulnerable to future downgrading.

EASTERN SLOPES POLICY ZONING

Since 1977 the Bighorn has been managed under the Eastern Slopes Policy, which was created to resolve land-use conflicts and had the primary objective of watershed protection.

Under the Eastern Slopes Policy, the Bighorn Wildland is zoned as Prime Protection and Critical Wildlife Zones. There are extensive Multiple Use Zones adjacent to the Wildland.

Prime Protection Zone

Intent: “To preserve environmentally sensitive terrain and valuable aesthetic resources.”

Industrial development and ORV use are prohibited.

Critical Wildlife Zone

Intent: “To protect wildlife populations by protecting habitat that is essential to those populations.”

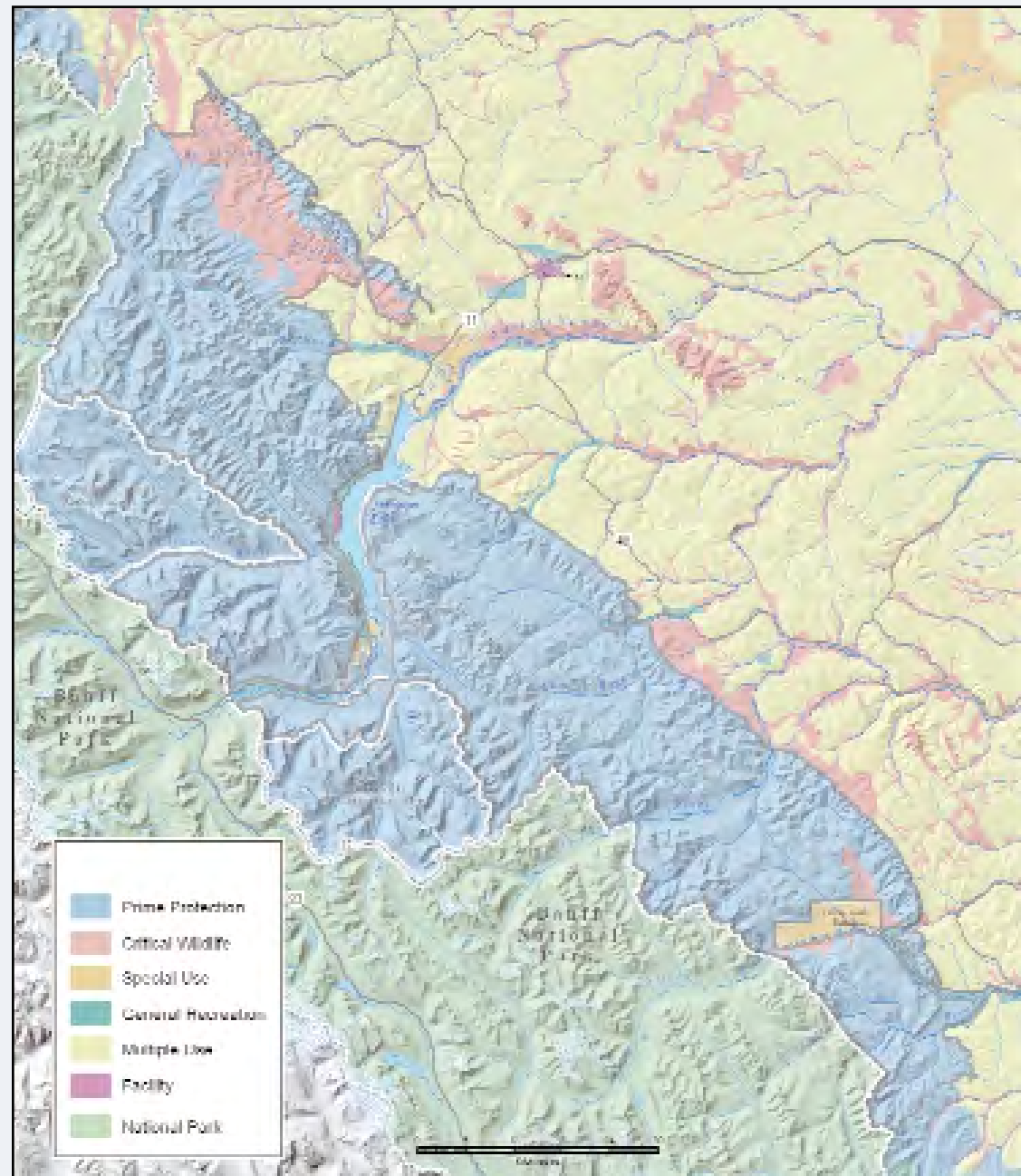
Industrial development and ORV use are permitted.

Multiple Use Zone

Intent: “To provide for the management and development of the full range of available resources, while meeting long term objectives for watershed management and environmental protection.”

Industrial development and ORV use are permitted.

These quotations are excerpted from the revised Eastern Slopes Policy 1984.





Ice crystals on the Bighorn River, nature's art formed by mist and spray in early winter.

CURRENT THREATS

The Bighorn is one of the last remaining large and relatively intact wilderness areas in Alberta. So far the area has seen little fragmentation by roads and industrial development. However, because the area is not protected by legislation, the threat of human intrusion is increasing. A number of competing industrial interests threaten the Bighorn region including petroleum exploration and forestry. Due to the recent encroachment of industrial activity and ORV users, access has become an issue of paramount concern.

Biologists have found that large mammals such as grizzly bears are only likely to survive in large areas with few linear disturbances like roads and trails. These disturbances lead to wildlife mortality by disturbing ranging patterns; fragmenting and degrading habitat; providing access for competitors and predators; and increasing hunting

pressure, road mortality and conflicts with humans. On a larger scale, access development leads to decreased biodiversity through the loss of species and habitats, the disruption of natural processes such as fire or water flow, and the acceleration of soil erosion and sedimentation.

In recent years, the government has sold leases to energy companies for sour gas extraction within the Bighorn Wildland. As industrial activity in the surrounding area continues, it becomes increasingly important that the Bighorn Wildland be protected by legislation and that development within its boundaries be prevented.

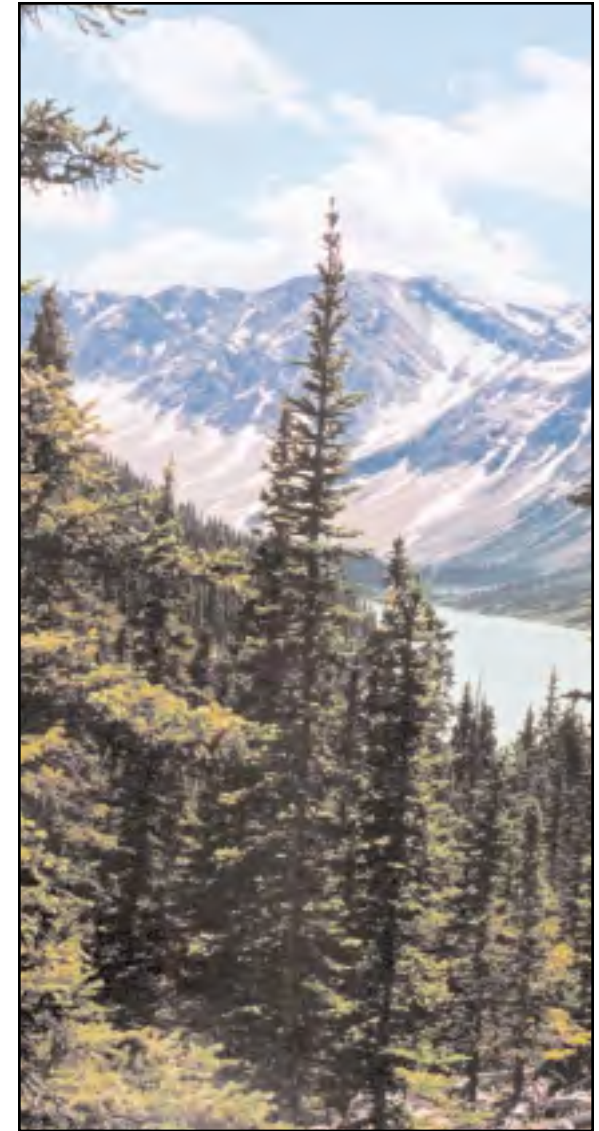
The recent access planning process legalized motorized recreational use in sensitive areas within the Prime Protection Zone. The government's ability to monitor and control this activity remains to be seen. The area's growing popularity as a snowmobile and ORV destination is worrisome, as parts of the Bighorn are becoming seriously damaged.

Alberta Wilderness Association (AWA) has been on the front lines of efforts to protect the Bighorn for three decades. AWA will continue to press the Alberta government to legally protect the Wildland, to prevent oil and gas operations and road construction, and to ensure responsible recreational use of the area.

Off-Road Vehicle (ORV): "any mechanized mode of transport used for recreation off of regularly maintained roads."

TIMELINE

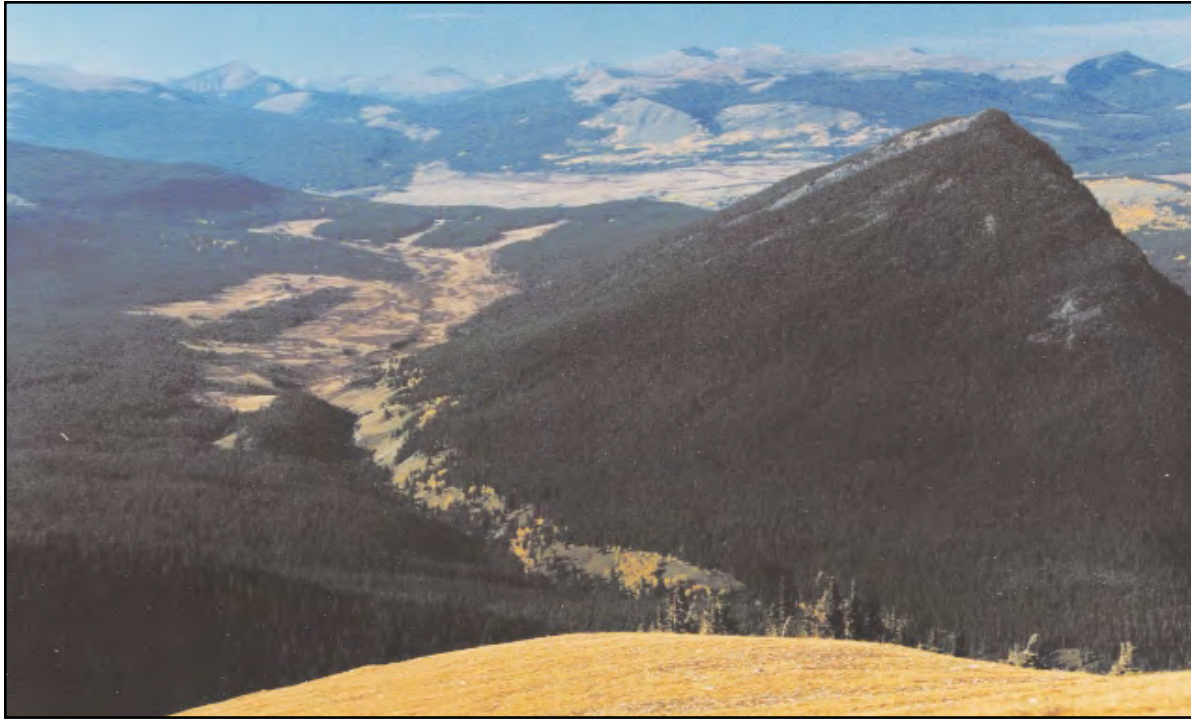
- 1974 The Environment Conservation Authority Report recommends emphasized protection of the natural values of the Eastern Slopes.
- 1975 The Alberta government promises that “a minimum of 70 per cent of the Eastern Slopes Region will be maintained in present natural or wilderness areas.”
- 1977 The Eastern Slopes Policy designates most of the Bighorn as Prime Protection Zone, off-limits to industry and ORV use.
- 1981 The government proposes David Thompson Country status, similar to Kananaskis Country, for the Bighorn region.
- 1986 The Nordegg-Red Deer River Integrated Resource Plan reinforces the Eastern Slopes Policy.
- 1986 A government publication and provincial maps include the Bighorn as one of Alberta’s protected areas.
- 1986 The Minister of Forestry names the Bighorn Wildland Recreation Area and releases a park-like brochure about the area, including a map and regulations.
- 1986 A government publication includes the Bighorn as one of Alberta’s protected areas.
- 1992 The Minister of Forestry reinforces protection of the Bighorn Wildland Recreation Area in a letter to AWA.
- 1993 The provincial committee for Special Places 2000 recommends that the Bighorn Wildland Recreation Area be formally designated.
- 1995-98 A series of government-commissioned reports document a large number of Ecologically Significant Areas inside and adjacent to the Bighorn Wildland.
- 1990s The government sells subsurface gas leases within the Bighorn Wildland.
- 2001 The government declares that the Bighorn Wildland is not protected and removes it from maps.
- 2001 The government initiates an access management planning process to plan access into areas where policy explicitly prohibits off-road vehicles and industrial development.
- 2002 The government creates six new Forest Land Zones and legalizes motorized recreation in portions of the Bighorn.



Eroding trails leading to Landslide Lake in the Cline River region and the lake’s declining fishery indicate the need for protection and proper management for such areas.



Rocky Mountain bighorn sheep is one of many species of wildlife that find refuge and superb habitat in the Bighorn.



A sub-watershed basin collects flow from Jap Mountain in the Panther Corners and carries it north to the major Red Deer River basin. Such Eastern Slopes basins must be protected, as they are integral to a water supply across the prairie provinces.

HISTORY OF EASTERN SLOPES WATERSHED PROTECTION

by Vivian Pharis and R. E. Stevenson

The forested watersheds of Alberta's Eastern Slopes, and particularly of the Bighorn Wildland, have been coveted since the federal government's surveys of the 1880s. A 1927 Dominion of Canada brochure regarding the Rocky Mountains National Forest was clear in stating that in mountainous regions, the primary use of forests may, by necessity, make timber production subservient to watershed

protection. In 1927 it was recognized that "forests are the greatest factor" in the control of run-off waters and in supplying downstream water needs.

Due to recognition that a continuous supply of quality water is fundamental to forest policies, the Eastern Slopes forests have been largely protected for most of the past century. Eastern Slopes forests supply most of the water for use across the prairies to Manitoba. The Saskatchewan River basin, which derives much of its water from the Bighorn Wildland, was designated for protection following the 1947 creation of the federal-provincial Eastern Rockies Forest Conservation Board. The board was established to research and manage Eastern Slopes natural resources, particularly water, so as to balance supplies with increasing downstream

domestic, industrial and agricultural uses.

The 1979 Eastern Slopes Policy and Integrated Resource Plans continued to recognize watershed protection as the priority use of the Eastern Slopes. However, through the 1980s and 1990s, both the federal and provincial governments reduced resources and staff in watershed research, management and protection. The federal government once supported a 13-member watershed research group active on the Eastern Slopes, and the provincial government had a specific watershed section within the Alberta Forest Service, but both are now gone. As of 2002, the provincial government withdrawal from upholding the principles of the Eastern Slopes Policy has been ominous.

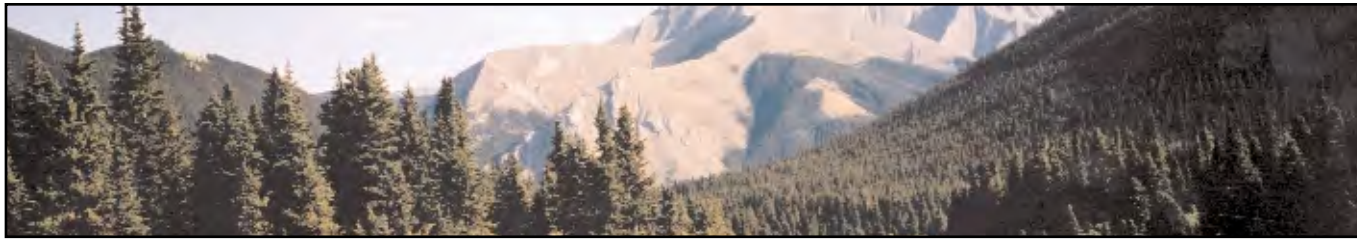
PANTHER CORNERS



3

VIVIAN PHARIS

PANTHER CORNERS



In the fall when the aspen turns an intense, luminous yellow, the complex of mountains, forests, meadows and streams known as the Panther Corners-Ya Ha Tinda is among the most strikingly beautiful scenery in Canada.

These 570 sq km provide some of the best wildlife habitat along Alberta's Eastern Slopes and is a favoured site for horse trail riders.



In any direction, the views from Marble Mountain are panoramic.

PANTHER CORNERS

Although the Ya Ha Tinda Ranch is under federal rather than provincial jurisdiction, it is an integral part of the local ecology and human use patterns of the Bighorn Wildland. Gentle, open-faced, forest-crowned foothills greet visitors to Ya Ha Tinda, with the scenic Red Deer River sliding past their bases. Upstream, the foothills rise in stature until they loom in craggy layers above forested valleys. In the far distance, 3000-metre peaks form the dominating backdrop along the Banff Park boundary.

The dramatically sudden upstream widening of the Panther and Red Deer River valleys is not visible from lower elevations. Where the Panther River joins Dogrib Creek and before the Red Deer's confluence with Bighorn Creek, forests give way to expansive natural meadows. Gently rolling open stretches of foothills reappear, and the whole demeanour of the landscape softens. At Ya Ha Tinda Ranch on the Red Deer River, a broad plateau sweeps in grassy grandeur across several kilometres, reaching west to the very foot of Warden Rock and Wapiti Mountain.

These two massifs flank the river like guardian lions just where the Red Deer leaves its birthplace among the icy peaks of Banff National Park to enter the Bighorn Wildland. To the south, the Panther and Dormer Rivers similarly burst from the park and through the Front Ranges into the Wildland's meadows. They steal away from the protection of Barrier, Dormer and Otuskwan Peaks, and join at the historic Corners before making a final plunge to meet the Red Deer River.

The Stoney call the subalpine grasslands of the Panther Corners and Red Deer River, Ya Ha Tinda meaning "Mountain Prairie." High elevation

meadows that abut and rise up adjacent slopes are characteristic of the Bighorn Wildland. Here in the Panther Corners-Ya Ha Tinda, they are most remarkable and provide critical habitat for overwintering wildlife.

The natural region where open forests of aspen and conifer overtake grasslands is known as Montane. Some of Alberta's best and most intact examples of this uncommon ecological region are the Panther Corners-Ya Ha Tinda and the nearby Clearwater valley. Ya Ha Tinda's grasslands and montane have been attractive to wildlife and humans since the ice age. Artifacts from ancient peoples indicate that the area has been inhabited for nearly 10,000 years. More than 60 archaeological sites have been surveyed. Recently, traditional eagle capture pits were recognized near the ranch.

Warm chinook winds that push through the broad mountain passes clear snow from lower slopes and valley floors, maintaining open grasslands of rough fescue and June grass. The rainshadow microclimate of the area is unique for its mildness and dryness. While consistent grazing by park horses and large ungulates promotes the growth of grasses and herbs and helps to keep shrubs from invading, overgrazing is a persistent problem that is changing the composition of plant communities and eliminating certain choice species, including rough fescue. Curtailing fires over the past century has resulted in shrinking grasslands, due to the invasion of shrubs and trees. Mechanical brush clearing to the east of Ya Ha Tinda Ranch is an attempt to control shrub growth. In 1987 clearcuts were allowed in the protected headwaters of Bighorn Creek, ostensibly to provide additional winter grazing. It appears that only the cuts at lower elevations, those with less snow, are grazed in winter.



Looking eastward, down the Panther River from the base of Jap Mountain, with Dogrib Creek valley entering from the left.



The beautiful Bighorn Falls are only a short hike from the Ya Ha Tinda road.

Adventurers can access the Panther Corners and the Ya Ha Tinda from the national park using excellent park trails along the Dormer, Panther and Red Deer Rivers. The first two trails connect with Banff townsite near Lake Minnewanka and the third, with Lake Louise. Within the Corners, resource exploration roads have replaced some traditional trails that date to early National Parks Service and Alberta Forest Service days. These were heavily eroded by off-road vehicles until the Panther Corners was designated in 1985 as a Forest Land Use Zone, off limits to motorized use. Today the old roads have become popular for horse-drawn wagons. Unfortunately their use has grown to the point where the former truck trails cannot regenerate, and erosion is again a problem.

A main attraction to horse riders is Jap Mountain and the splendid 360-degree views from its top. Trails ascend from both the Panther and Red Deer sides. Reclaimed coal exploration roads that cross its face have become popular trails. Trails also lead to lower elevation Dormer Lake, which is stocked for recreational fishing with introduced brook trout, and high elevation Ice and Barrier Lakes, stocked with cutthroat trout. A historic horse trail follows Dogrib Creek, crossing Ribbon Flats and descending Wolf Creek to eventually reach the Red Deer River at the Bighorn campground. In October 2001, the Dogrib valley was burned in a large fire that swept the valley and carried on down the Red Deer River before turning north, outside the Wildland.

Along the Panther River, outfitters often claim favourite campsites early in the year, erecting large canvas tents, which they surround with low electric fences as protection from hungry bears. Informal camping on the Panther's scenic open benches has been popular for most of the last century.

The open grasslands and slopes of the Ya Ha Tinda are a magnet for horse trail riders. From the Bighorn and Eagle Creek campgrounds, multiple trails lead up most accessible slopes and valleys, many allowing loop trips. The unsurpassed scenery, the lure of riding the open ranges and the many mountain trails are unfortunately resulting in increased erosion, especially on popular trails, as along Bighorn Creek, and on steep slopes throughout the area.

On the north side of the Red Deer, camping is confined to a few spots along the river and to the more formal Bighorn and Eagle Creek campgrounds. The Eagle Creek campground is just outside Ya Ha Tinda's eastern boundary, while the Bighorn campground is inside the ranch property. Both campgrounds have become popular with day trip horse riders. They are both maintained by the Friends of the Eastern Slopes, a group of volunteers who have been doing an admirable job. However, it cannot be expected that volunteers alone will be able to maintain the proliferation of use and trails that is occurring in the Panther-Ya Ha Tinda complex.

The Panther Corners' value as superb wildlife habitat and its exceptional scenery were recognized as far back as 1902, when the area was included in Rocky Mountain National Park. Both early park rangers and forest wardens used a cabin at the Corners junction of the Panther and Dormer Rivers. Due to boundary and administrative changes, this area was twice made part of, and twice excluded from, the park.

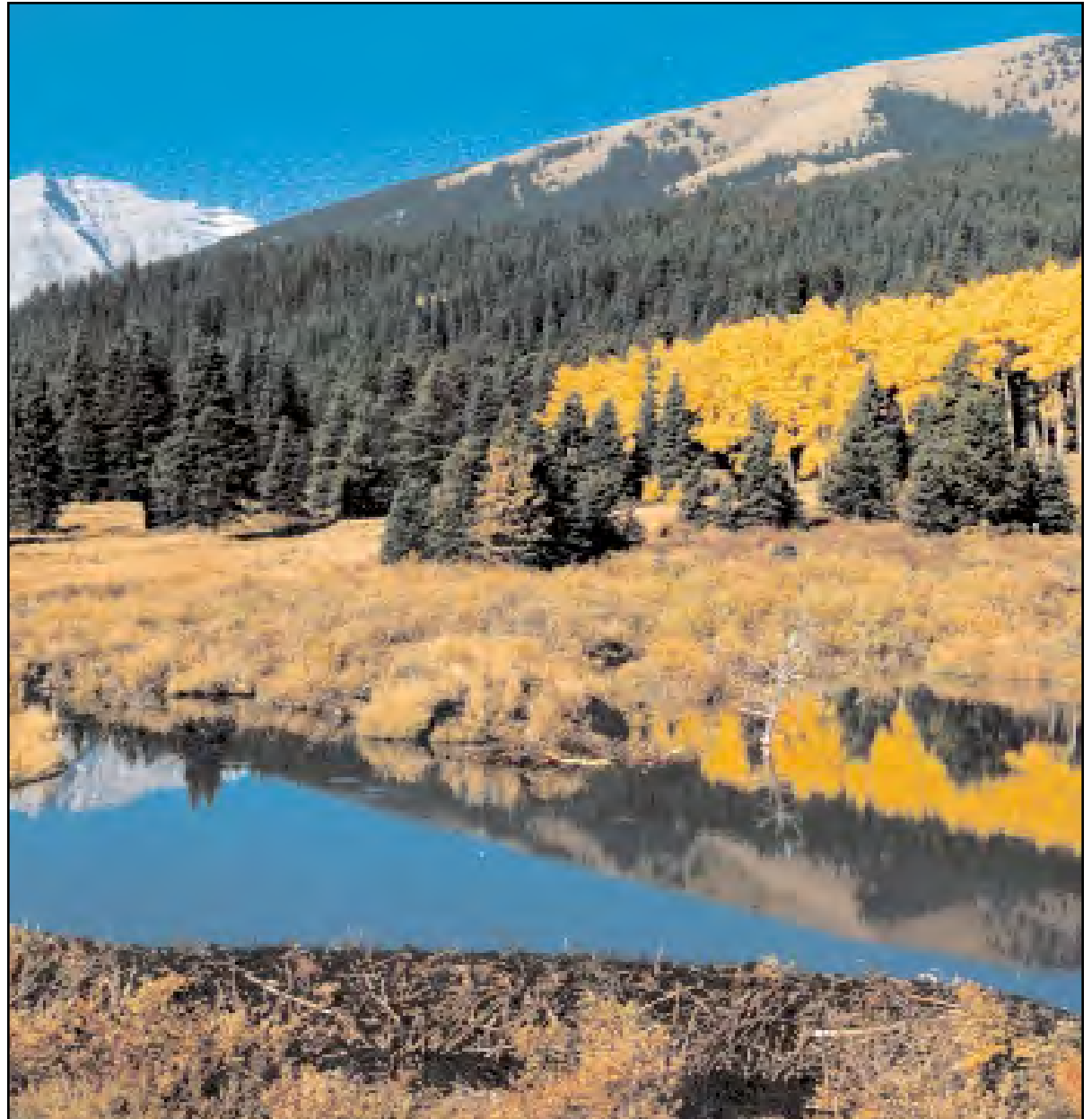
In 1971 extensive coal exploration was carried out on Jap Mountain in the heart of the Panther Corners. The passing of the 1976 Coal Policy forever excluded this sensitive area from coal development, and Heritage Trust Fund monies were

used to reclaim Jap Mountain's roads and exploration pits. Unfortunately, reclamation of these high-elevation lands was not completely successful, as the scars will remind us into the distant future.

Exploration for oil and gas occurred throughout the Panther Corners-Ya Ha Tinda in the 1950s and 1960s. An abandoned road and wellsite just west of the ranch buildings can still be seen. One wellsite road was punched into a valley on the east side of Panther Corners as late as 1983. Alberta Wilderness Association formally challenged drilling in this Prime Protection Zone area, and the company withdrew without drilling. The access damage was subsequently reclaimed. In 2001 Shell Canada, the primary petroleum leaseholder in the area, stated publicly that it would not drill in the Prime Protection Zone between the Panther and Red Deer Rivers west of the Ya Ha Tinda road.

GETTING THERE

There are two roads by which visitors can reach the main entrance to this part of the Bighorn Wildland. Highway 591 leads west from Sundre and Highway 940 (the Forestry Trunk Road) comes north from Calgary and south from Edson. While Highway 591 is paved to the Forest Reserve boundary, 940 is unpaved. From where these roads meet, local roads can take travellers further upstream into the Wildland. One road follows the south side of the Panther River for nine km. to a large equestrian staging area, and another follows the north side of the Red Deer River for 25 km to the Bighorn and Eagle Creek equestrian camps.



September's aspen are nowhere more brilliant than along Dogrib Creek. It will be some time before similar views reappear because this area was burned during the 2001 Dogrib fire.



In the last 15 years, thousands of antlers have been gathered from Jap Mountain and neighbouring slopes in the Panther Corners and sold to be ground into medicines for the Asian market.

THREATS TO ECOLOGICAL INTEGRITY

Why Protection, Management and Enforcement Are Necessary

- Overuse and erosion caused by equestrians and horse-drawn wagons, especially within a few hours travel from staging areas and popular campgrounds
- Erosion around staging areas and equestrian base leases on Wildland boundary
- Overuse of some backcountry campsites
- Snowmobile harassment of wildlife in nearby Scalp Creek along the northern boundary of Ya Ha Tinda Ranch
- Snowmobile impaction damage to soils, plants and small mammals wintering under the snow
- Proliferation of backcountry trails
- Industrial development on adjacent lands – oil and gas, logging, cattle grazing
- ORV encroachment into protected areas and damage to adjacent lands and waterways
- Brush and forest encroachment onto grasslands
- On Ya Ha Tinda Ranch, conflict between horse numbers and wildlife for available fodder, and consequent overgrazing
- Lodges on perimeter that threaten to become major tourist developments

SUPERB HABITAT

The Panther Corners-Ya Ha Tinda forms one of the most important elk winter ranges in Alberta. Herds as large as 2000 have been known to migrate into the area in late fall, mainly from Banff and Jasper National Parks. Weeklong mid-winter hunts were used in the 1970s as a herd reduction tool, until they became politically unpalatable. Today up to 1000 elk use the area to pass the winter. They share the range with such year-round residents as 400 bighorn sheep, mule and white-tail deer, and a range of predators, including the wolf, the grizzly and black bear, the cougar and the rare wolverine. Pine martens and red squirrels are found in pockets of old-growth forest, while hoary marmots, pikas and golden-mantled ground squirrels frequent the subalpine. More than 150 species of birds, native bull trout and three species of introduced game fish are found here.

Jap Mountain, a 2500-metre ridge protruding east from Barrier Mountain, and other neighbouring ridges with exposed south- and west-facing slopes that are grassed to their very crests are superb habitat. Prior to the discovery in the late 1980s that cast antler could be a commodity in the Asian market, these slopes were strewn with sun-bleached elk antlers, attesting to the number of animals that come here to overwinter.

Fall hunting is a historic Panther Corners-Ya Ha Tinda recreation. Trophy elk, bighorn sheep and mule deer are all sought after. Come September, summer day riders are replaced by elk and sheep hunters, who occupy roadside campgrounds or pack into backcountry hunting camps, high up the Red Deer and Panther Rivers, Scalp Creek and other nearby valleys.

YA HA TINDA RANCH

Surrounded by the Bighorn Wildland and Banff National Park, the Ya Ha Tinda Ranch covers almost 4000 hectares of grasslands and mixed-wood forest along the north side of the Red Deer River. It is the only federally operated horse ranch in Canada and is used to breed, raise and train horses for warden backcountry patrols in the four mountain parks – Banff, Jasper, Yoho and Kootenay. Today, about 180 horses spend the winter at Ya Ha Tinda.

A Stoney Nation mountain guide, William Twin Hunter, introduced the well-known Brewster family of Banff to the Ya Ha Tinda area around 1904. At that time, the Ya Ha Tinda was outside the boundaries of Rocky Mountain National Park, and the Brewsters were able to establish a ranch at the site, where they bred and broke horses to support their guiding and outfitting business.

Park boundaries incorporated and excluded the Ya Ha Tinda several times. In 1917 when the area again fell within Rocky Mountains National Park jurisdiction, it became the park's facility for breeding, training and wintering horses for park use. Although the ranch was finally excluded from Banff National Park in 1930, a 1958 agreement between Canada and Alberta gave the federal government management jurisdiction for the area. The province became responsible for wildlife and mineral rights. This remains the situation to the present.

Vivian Pharis and her husband, Richard, have trekked and photographed throughout the Bighorn Wildland since the early 1970s. They were both involved in presentations at the Eastern Slopes hearings in 1973 on behalf of these lands, and in the development during the 1980s of Integrated Resource Plans that included lands of the Bighorn Wildland. The Pharises began explorations into the Bighorn through extended backpacking tours. Often they travelled in the company of such wilderness enthusiasts as fellow former AWA presidents Ray Sloan and Don Wales, as well as with Dan Olson, Ed Wolf and others. In the late 1970s the Pharises acquired horses and slowly built their pack string to eight or nine, enough horses to comfortably take themselves and friends on extended trips over the Bighorn's many trails. The Pharis pack string also assisted in 10 years of cleaning garbage from the Bighorn's backcountry camps and trails, and in maintaining the historic Bighorn Trail since 1994.



After the snows of winter melt, the grasslands of the Ya Ha Tinda become lush with native grasses and forbs.

UPPER CLEARWATER



4 VIVIAN PHARIS UPPER CLEARWATER



North of the Panther Corners-Ya Ha Tinda complex, trails lead hikers and horse trail riders into a varied landscape of elongated open ridges, thickly forested foothills and magnificent peaks, their beauty often accented by exquisite jewel-like lakes nestled in their folds.

Glaciated valleys snake west to east through the landscape, the dominant one being the valley of the Clearwater River, whose sprawling course catches all the waters flowing from this portion of the Bighorn Wildland.



The Clearwater's braided stream is one route into the upper Clearwater Valley.

UPPER CLEARWATER

The Clearwater River arises amongst glacier-laden peaks and a myriad of turquoise lakes in a remote corner of Banff National Park. Near its exit from the park into the Bighorn Wildland, the Clearwater's valley widens considerably, and pockets of the provincially uncommon Montane ecoregion and of the subalpine grasslands that characterize neighbouring Panther Corners-Ya Ha Tinda enhance its course.

The only vehicle access to the Upper Clearwater valley is Cutoff Creek Road, which can be reached from Highway 940, the Forestry Trunk Road, at Seven Mile Flat. This local road takes visitors approximately 15 km west to the Cutoff Creek campground and staging area on the eastern boundary of the Bighorn Wildland and Upper Clearwater Forest Land Use Zone.

For those with sufficient backcountry skills and a sense of adventure, the many open ridges in the headwaters of Scalp, Skeleton and Bighorn Creeks, to the north of the Ya Ha Tinda Ranch, offer superb opportunities for extended off-trail hiking. With a compass or GPS and the appropriate topographical maps, hardy trekkers can explore this region for a week or more, experiencing incredible vistas, a choice of gentle or challenging terrain, a variety of wildlife and little chance of encountering another human being.

The upper reaches of Scalp and Forbidden Creeks hold delightful surprises for those willing and able to venture into them. From waterfalls that slip through smooth limestone notches into seductive pools to hidden side valleys suddenly alive with the vibrant hues of a dozen varieties of Indian paintbrush, there

are treasures here rarely glimpsed by the human eye. For those who travel by horse or prefer the security of trails, the Upper Clearwater has much to offer, including extended trips into Banff National Park, the Siffleur Wilderness or further reaches of the Bighorn Wildland. One popular trail is an abandoned exploration road that leads from Ya Ha Tinda Ranch up Scalp Creek, down Skeleton Creek and into the Clearwater drainage. Just before reaching the Clearwater River, a trail (old road) branches west into the high mountains of Forbidden Creek, on the Banff Park boundary.

A high pass at the head of Forbidden Creek could be a hiker's route across to Divide Creek in Banff Park. This is a good place to spot bighorn rams that often feed on the nutrient-rich grasses and forbs growing in the fine black shale of the pass. From upper Forbidden Creek, a trail continues north to the Clearwater River, following routes on both the park and provincial sides of Peter's Creek. If an extended trip has been planned and the necessary park permits obtained, the Clearwater trail may be followed west into a wilderness portion of Banff Park in the headwaters of the Clearwater River. Park trails may then be followed to the Banff-Jasper Highway, to Lake Louise down the Pipestone River or to the Kootenay Plains down the Siffleur River.

Within the Wildland, the historic Headwaters trail climbs out of the Clearwater valley about 1.5 km. downstream of the Banff Park boundary and leads visitors north, on a high country adventure through the heart of the Ram Headwaters and eventually to the North Saskatchewan River. About 12 km downstream, at the junction of the Headwaters and Clearwater trails, another well-used trail travels north. The Lost Guide trail climbs out of the Clearwater valley, rising about 300 metres to a gem of a lake tucked into a classic

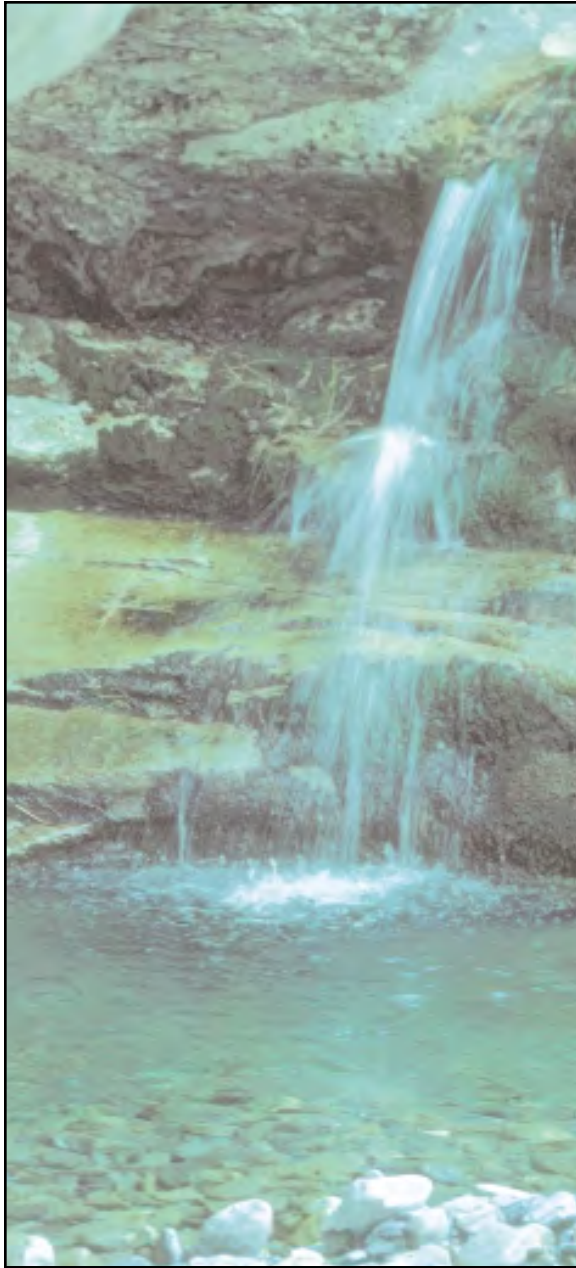
THREATS TO ECOLOGICAL INTEGRITY

Why Protection, Management and Enforcement Are Necessary

- Snowmobile harassment of wintering wildlife
- Snowmobile impaction damage to soil, plants and small mammals wintering under the snow
- Petroleum exploration and development on the eastern boundary
- Logging on the eastern boundary of the Bighorn Wildland
- Increasing off-road vehicle use on boundary lands and motorized intrusions into the Forest Land Use Zone
- Erosion from horse use on steep and heavily used trails
- Increasing use of horse-drawn wagons that cause erosion and allow for inappropriately large and elaborate backcountry camps



The upper reaches of Scalp Creek that lie on the national park boundary are a newly designated snowmobile frolic area.



The upper reaches of Scalp and Forbidden Creeks sparkle with water jewels like these rock pools.

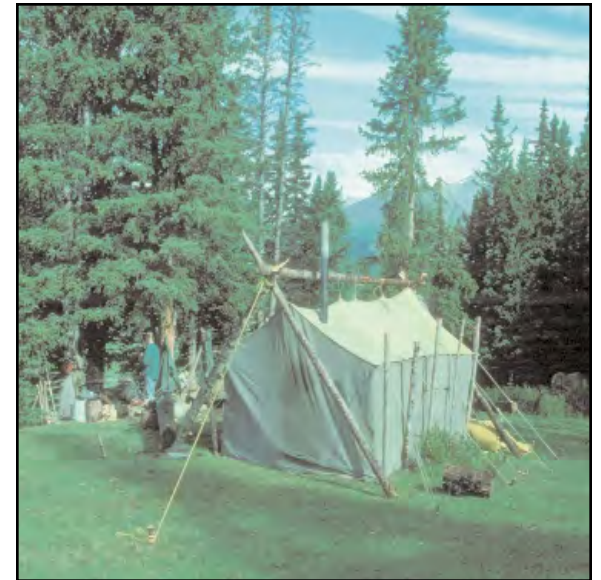
cirque, surrounded by Lost Guide Mountain. From the height of land near the lake, the trail drops steeply into the Ranger Creek valley, where trails lead into the Ram Headwaters area. The chance to catch a cutthroat trout and to see a picturesque lake has meant the steep trails on both sides of this divide are suffering erosion from overuse.

Within the Upper Clearwater are many old outfitter camps; most are well located on high ground with accessible water and good grazing for horses. The open forests and valley grasslands of the Clearwater are important elk winter range. In the summer, when the elk have dispersed into nearby hills, deer and the occasional moose are more likely to be seen along valley bottom trails. Bighorn sheep frequent open slopes throughout the Clearwater, some being permanent residents while others meander in and out of Banff Park. Grizzlies, wolves and cougars occur throughout the area, although not in large numbers, and some feral horses also live there. Trappers, who take mainly pine marten pelts, use the Clearwater, and hunting is a popular fall activity, with bighorn sheep and elk being the main sought-after species.

In the late 1960s and early 1970s, extensive seismic activity was conducted in the Clearwater, including one line that traverses the main drainage to the very boundary of Banff National Park. Although several wells were drilled on the eastern edge, all were abandoned. Coal was also sought throughout the Clearwater foothills, and exploration evidence remains to this day, as can be seen on slopes above Scalp Creek. Today the Clearwater region falls under the Prime Protection Zone of the Eastern Slopes Policy and Category 1 of the Coal Policy, which means it is off-limits to industry. Intensive off-road vehicle use of exploration roads caused watershed erosion and wildlife harassment problems, until the entire unit

of the Upper Clearwater was put under protective Forest Land Use Zone legislation in 1986.

New recreational decisions in 2002 appear to have reversed earlier protection and recognition of the Clearwater as important elk wintering habitat. A new snowmobile route was approved in 2002 across 40 Mile Flats, up the Clearwater valley and over Skeleton Creek into the Scalp Creek drainage at the Scalp Creek Natural Area. With special permission, snowmobiles will even be allowed through key elk and bighorn sheep winter range along the northern boundary of Ya Ha Tinda Ranch to Eagle Lake. Formerly pristine Scalp Creek headwaters on the boundary of Banff Park have also been declared open to snowmobile frolicking.



At the end of a long day in the saddle, the comforts of a snug camp are greater than those of a five-star hotel.

IMPORTANCE OF WETLANDS AND WATERSHEDS

by Heinz Unger

Intuition, experience and research have taught us that the watersheds and wetlands of the Eastern Slopes are important for stream flow volumes, water quality, local and regional climate and precipitation, natural habitats and economic benefits, as well as for salving our senses and renewing our spirits through their richness and beauty.

From the forest canopy to the soils beneath, forested watersheds are unique hydrological entities. Forest cover significantly reduces peak runoffs, preventing erosion and resulting in more equalized flows and flow rates throughout the year. Trees, soils and healthy, undisturbed stream and river channels filter water and ensure high water quality for aquatic life and human use. Water quality and quantity are enhanced by wetlands, which may be tarns, sloughs, bogs or muskegs. Such wetlands may be created by beaver dams, and they provide effective off-stream storage and water treatment. Wetlands are habitats for a great variety of plant and animal life.

Recent research has pinpointed another valuable watershed service from forests. Up to two-thirds of precipitation falling inland derives from evapotranspiration from mainly forest vegetation. Providing local rain and snowfall, as well as ensuring water quality and quantity, are important economic benefits from forests, which are not always recognized and appreciated. Other undervalued benefits from watersheds and wetlands include the avoided costs of water storage and treatment, as well as the recreation and tourism associated with water.



Sensitive wetlands purify water and provide essential wildlife habitat.

RAM HEADWATERS



5

VIVIAN PHARIS

RAM HEADWATERS



Like the Panther Corners and Clearwater regions of the Bighorn, much of the Ram once fell under national park protection. It was excluded from the park system prior to 1930 because of possible provincial interest in extraction of the mineral resources.

Today the Ram remains an area of high aesthetic value and sensitive terrain with broad opportunities for dispersed backcountry recreation. From expansive alpine scenery, wildlife in wild settings, intimate waterfalls and water-sculpted rock pools, to a dipper's secluded nest, the Ram abounds in natural delights. Many believe these have far greater worth than the minerals underlying portions of the area.



The middle tributary of the South Ram is a surprisingly gentle landscape dotted with emerald tarns.

RAM HEADWATERS

The Ram Range is a broad swath of mountainous terrain that is the southern extension of the Rocky Mountains Front Ranges. Here are prime watersheds, key wildlife habitats and lands of exceptional aesthetics. Historically, the western flank of the Ram Range has been called Headwaters because it is the source of the North and South Ram Rivers, which catch large quantities of new-fallen snow and rain. The two rivers join outside the Wildland to become a major tributary of the North Saskatchewan River. Watershed services are considered the greatest contribution from the Ram Headwaters region. However, the alpine and subalpine terrain is renowned for its beauty and its habitat for ungulate animals, large carnivores and a range of game fish. It has a reputation as some of the most prime fall outfitting territory in Alberta.

“Heaven on earth” could describe a week of horse packing up Ranger Creek from the Hummingbird equestrian staging area, across the historic Headwaters trail to the South Ram River, and back in a big loop along the tops of Canary, Hummingbird and Onion Creeks, and past exquisite Onion Lake. Midway on the loop, from an idyllic camp high on the South Ram River, days could be spent exploring each of three tributary valleys and their composition of glaciers, hanging lakes, plunging waterfalls and wildlife at home on their ranges. Sites along the South Ram loop have so won the hearts of people that a surprising number have chosen to have their ashes scattered at places along the trail special to them. An unobtrusive commemorative plaque sometimes marks such places. Unfortunately, the ecology of the Headwaters has been allowed to degenerate from off-road vehicle incursions into what are supposed to be Prime Protected lands.

The North Ram region may be reached on a continuation of the Headwaters trail, which can then be followed north all the way to the North Saskatchewan River near the Bighorn Dam. Another trail to the high reaches of the North Ram climbs west upstream from a staging area at the junction of North Ram and Kiska Creek – a trail that eventually leads overland to Whiterabbit Creek.

The North Ram River and Whiterabbit Creek have been remote wilderness enclaves. These areas sustained considerable damage to wetland meadows and streambeds from off-road vehicle use in 2001, but in 2002 were protected as a Forest Land Use Zone, which prohibits motorized use except on certain designated trails. If this legislation is effective, the area may over time recover naturally from the damage.

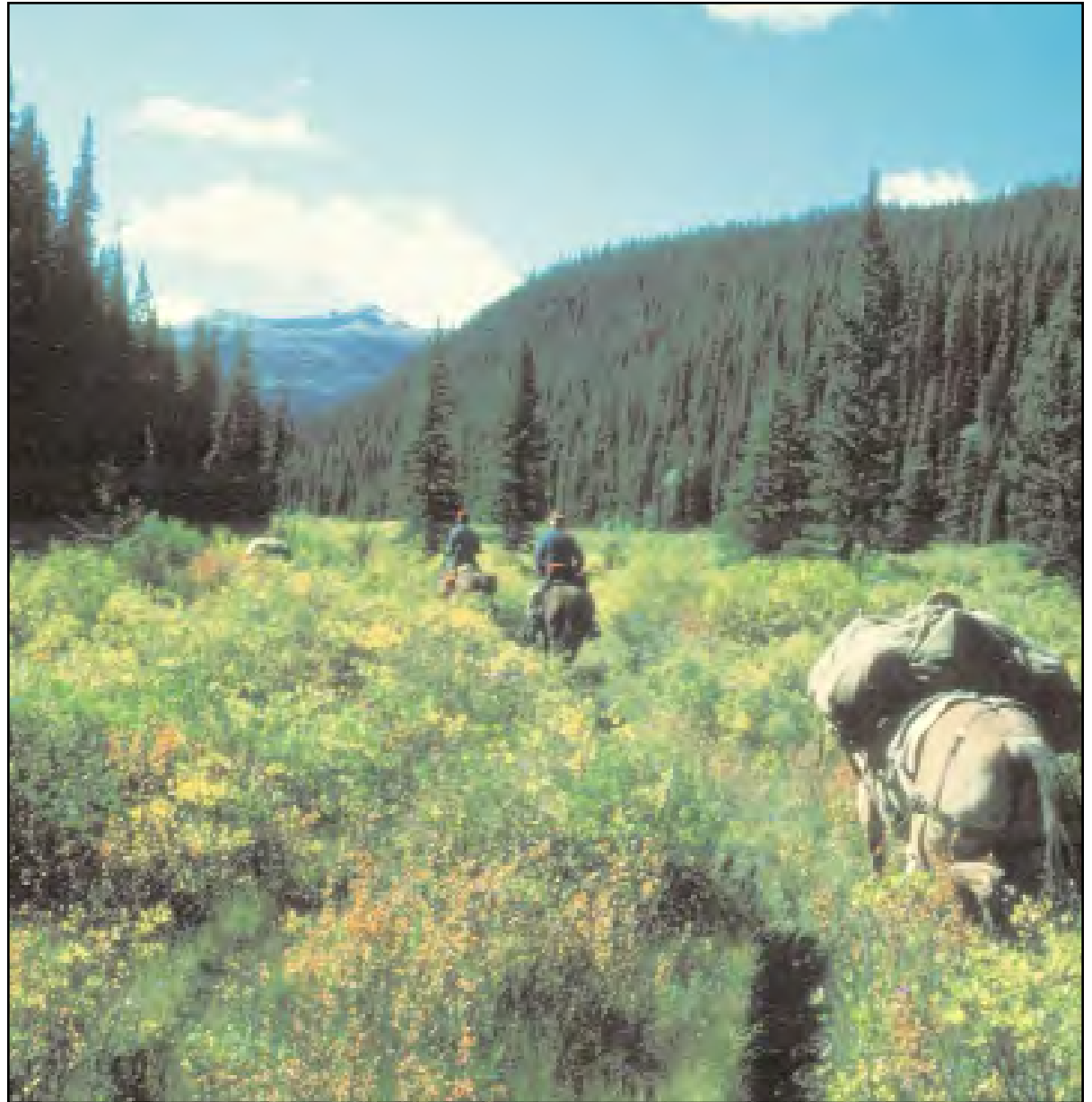
The beauty of the North Ram is best appreciated from the tops of open ridges, many of which can be reached on old outfitter trails. In July of each year, these ridges put on a dazzling show of colour and movement as the winds ripple across vast meadows of flowers in deep purples, brilliant yellows and saucy scarlets. In any month, however, these ridges offer wide and enthralling views. Views of Abraham Reservoir and the rugged ranges of the Littlehorn and Bighorn, from high lands along Whiterabbit Creek, are breathtaking.

Guided fall hunting has a long-established presence in the Ram, an area famous for its many record-book trophy bighorn sheep. Elk, moose, grizzly and wolf are also sought here during hunting season. Summer trail riding, especially longer packing trips, is another established and historic use of the area, and a use destined for growth if land management improves. Today one outfitter holds the non-resident bighorn sheep

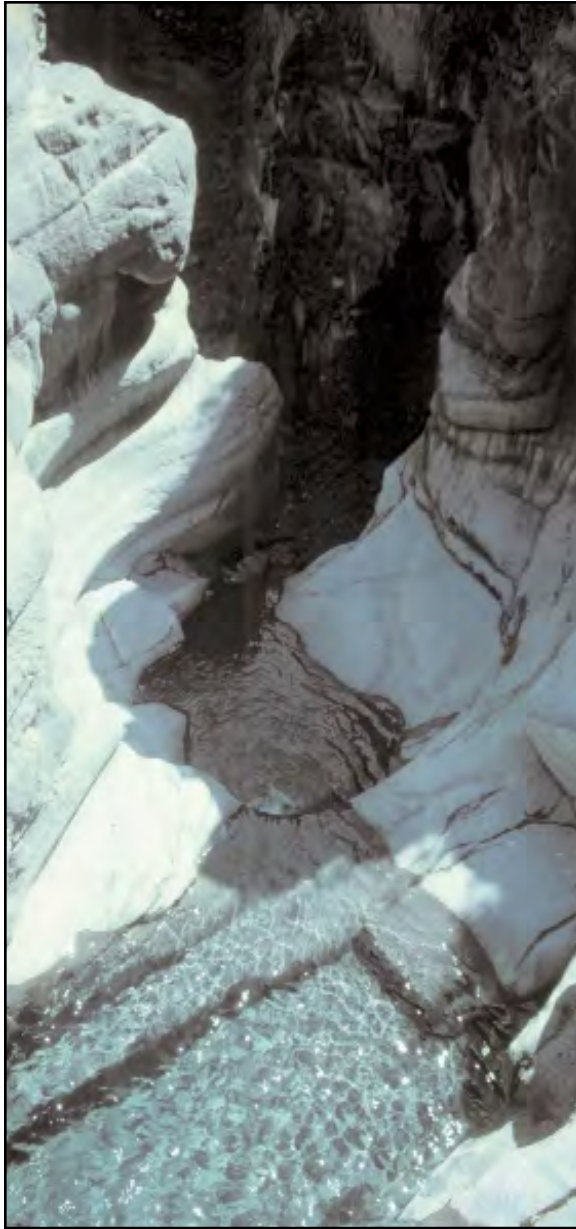
permits for the South Ram, and another holds these permits in the North Ram. Two outfitters guide summer trail rides through the South Ram, and one guides in the landscapes of the North Ram.

Relatively remote open slopes and lush forested valleys within Ram River drainages are some of Alberta's richest and least disturbed grizzly bear habitat. Refuge for these animals still exists in the three tributaries of the South Ram, along Whiterabbit Creek and through much of the rugged North Ram. Canary and Hummingbird Creeks are also prime grizzly habitat. It is common to find Ram area slopes extensively torn apart by black and grizzly bears, a result of the animals' search for the starchy rhizomes of sweet vetch and for the occasional fat ground squirrel. A mother and cubs may spend an entire feeding season in one high valley, systematically digging and eating along its slopes.

Some 600 bighorn sheep inhabit area ridges in summer, drifting in and out of Banff Park and the Siffleur Wilderness Area. Rocky Mountain goats suffered significant population losses in the 1960s when exploration roads penetrated parts of the Ram. Despite protection since 1969, their populations have still not recovered to historic levels. Elk numbers are also well below summer carrying capacity and winter motorized use of key habitats, especially along Hummingbird Creek, Onion Lake, Kiska Creek and west of Ram Falls, will undoubtedly reduce their numbers even further. Bighorn sheep overwintering in these areas will also suffer.



Entering the North Ram from Onion Lake, the trail breaks out into a willow-filled meadow.



On a tributary of the lower Bighorn River, rarely visited by humans because of its rugged terrain, are beautiful pools sculpted into limestone bedrock.

When Alberta Wilderness Association proposed the Ram-Whiterabbit as a protected Wildland at the 1973 Eastern Slopes hearings, the area was considered highest quality wilderness and summer-fall habitat. Parts were also recognized as important winter range for ungulates. The area was the focus of presentations made by many of the citizens concerned with protecting the Eastern Slopes at the hearings. Much of the higher elevation land had been spared major human disruption caused by coal and oil and gas exploration. Several exploration roads on the eastern side had been reclaimed using Alberta's Heritage Trust Fund. The area abutted a number of already protected areas – the Siffleur Wilderness, Banff National Park and the candidate Kootenay Plains Ecological Reserve. Following recommendations from the Eastern Slopes hearings, the 1977 Eastern Slopes Policy placed almost all of the Ram-Whiterabbit under the Prime Protection Zone. The future of the Ram-Whiterabbit as fully protected seemed assured.

However, by the completion in 1986 of the Nordegg-Red Deer River Integrated Resource Plan, including guidelines for managing the Ram and adjacent lands, off-road vehicle damage had already significantly increased. Previously reclaimed roads had been worn back into vehicle trails, and off-trail excursions were scarring wet, steep and sensitive areas. Despite strong direction in the Ram Headwaters section of the Integrated Resource Plan to protect watersheds and habitats, particularly for grizzlies and fish, protective legislation never materialized. This sensitive and lovely landscape was increasingly abused, and today the Ram remains the most heavily used and affected area within the Bighorn Wildland. Some watersheds and wildlife habitats are so compromised, they will take decades to repair. Whether the partial controls on motorized

recreation that was legislated into effect in 2002 will allow the area to recover remains to be seen.

While Ranger Creek, both Ram drainages and Whiterabbit Creek are now off-limits to summer vehicle use under 2002 legislation, other Bighorn lands have been designated for continued motorized use. Canary, Hummingbird and Onion Creeks, all of which are zoned for highest protection under the Eastern Slopes Policy, are open to off-road vehicles for ten months of each year. Snowmobiles are allowed broader playgrounds in Ram River watersheds and critical winter habitats, including Ranger Creek, from October 1 to April 30 as well as frolic areas on open slopes in the Ranger headwaters and above Onion Lake. The Hummingbird-Canary-Onion portion of the Ram will become a classic test of our ability to regenerate alpine and subalpine watersheds and habitats.



ORV damage to wetlands like these in the headwaters of the South Ram will heal in time, once the source is eliminated.

THREATS TO ECOLOGICAL INTEGRITY

Why Protection, Management and Enforcement Are Necessary

- Off-road vehicle–caused erosion in Hummingbird/Canary/Onion/Headwaters trail
- Declining wildlife populations because of off-road vehicle and snowmobile harassment
- Snowmobile compaction damage to soils, plants and small mammals wintering under the snow
- Increasing numbers of hunters using the area by off-road vehicles that often pull laden trailers, causing erosion, stream degradation, and noise pollution and detracting from a wilderness experience
- Increasing and unmanaged horse use causing erosion on steep and soft trails
- Off-road vehicle incursions into protected portions

An old research station stands at what used to be the tongue of the Ram Glacier in 1960. Today it is almost a half kilometre away from the rapidly thawing ice pack.





Dwarf birch and willow paint the foreground of an early autumn view of the Ranger Creek headwaters.

INTRIGUE AMONGST THE GARBAGE

Alberta Wilderness Association has a history of cleaning backcountry trails and camps that goes back to 1972 when the Association first cleaned the area around Pinto Lake. AWA garbage baggers blitzed the Panther Corners in 1983, and in 1984 AWA's Vivian Pharis initiated a 10-year systematic purging of the rest of the Bighorn.

Ranger Creek in the South Ram drainage has camps along its entire length and a long history of use. It was dirty and slated for cleanup in 1987. Vivian Pharis and Dianne Pachal packed in before the July long weekend to set up a base camp for volunteers who were to follow on foot. Camp was located midway along the creek, and the horses were hobbled to graze. As the evening meal drew to a close, the eastern sky became an eerie yellow and was soon overhung by a bank of leaden clouds. That night it poured until the pounding in Ranger Creek shook the ground. Vivian and Dianne knew they were stuck for a matter of days and that their walking crew had no chance of joining them.

The next few days were a mix of drizzle and sun as the two grubbed through abandoned seismic camp and outfitter garbage, and filled bags so heavy they could only drag them. By the end of the third day they had cleaned all but two headwaters camps. It rained a bit in the night and they rode in mist up the valley the next morning. As they approached a high camp in the shelter of heavy trees, mist engulfed it. The atmosphere seemed dank and ominous. Something was amiss. They circled a canvas wall tent draped with a blue plastic tarp that was filled and sagging with water. Clothes and bedding were strewn out the door and a table was collapsed inside.

Finally, they decided the situation was safe and spent the rest of the morning bagging the spoiled belongings of people who had left in an awful hurry. They had even jettisoned spurs and prescription medication. From information on the medication, the Forest Service was able to eventually track down the camp's owners and make them come back to remove the tent. Apparently a pair of hunters had killed an animal late the previous fall just as the weather was turning bad, so they had loaded it onto their one pack mule and fled, leaving behind an entire camp – a camp where, for a while at least, the two trail riders expected to find something a lot more sinister than a bag of rotten wieners hanging from the tent's ridge pole.

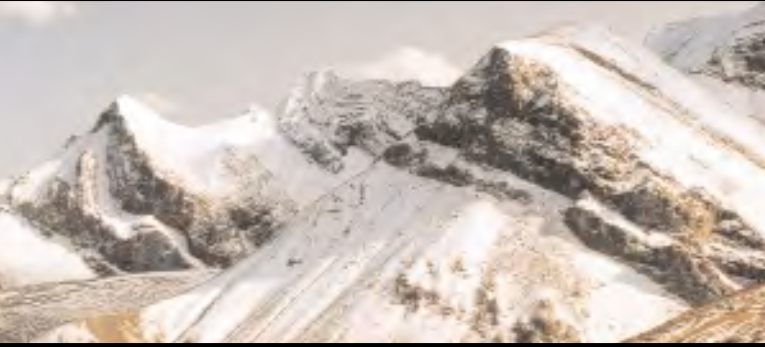


Garbage from campsites, some with more than 60 years of accumulation, was bagged throughout the Bighorn over a 10-year period.



Heavy bags of garbage were stacked for lift-out by the Alberta Forest Service.

WAPIABI-BLACKSTONE-SUNKAY

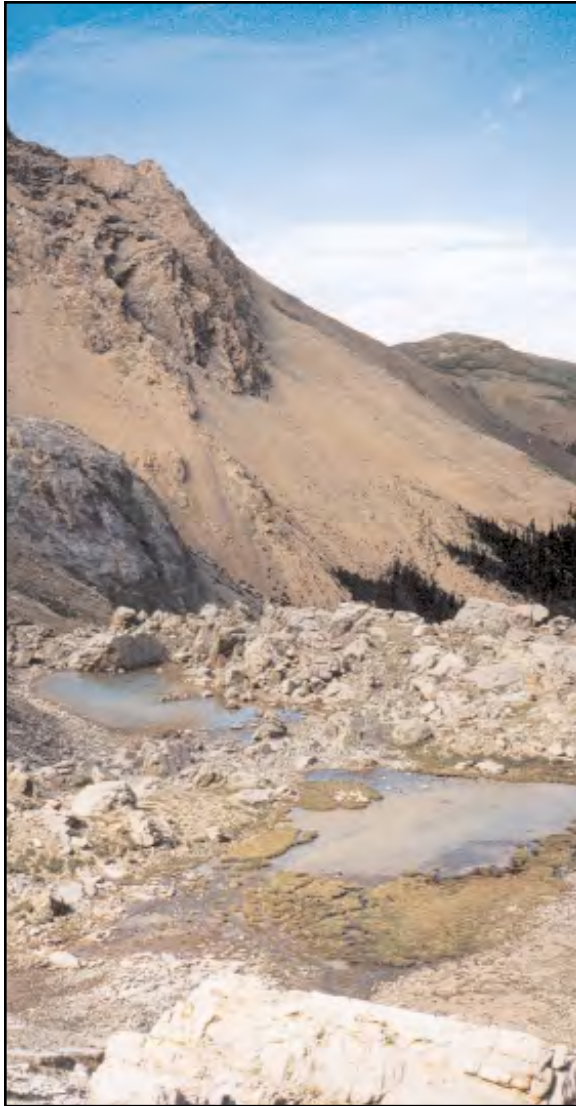


VIVIAN PHARIS

WAPIABI-BLACKSTONE-SUNKAY



*The Wapiabi-Blackstone is the haunt of the wolf.
Here, more often than elsewhere in the Bighorn, its plaintive wails may
be heard between dusk and dawn. Occasionally a curious wolf will sit at a
distance from a Wapiabi camp, watching the movement of campers
and sometimes answering an authentic-
sounding human “call of the wild.”*



To the east of Vimy Ridge, Vimy Creek arises from a series of icy tarns.

WAPIABI - BLACKSTONE - SUNKAY

In the northeastern corner of the Bighorn Wildland, the Wapiabi-Blackstone forms an aesthetically and geographically distinct land unit. Between two imposing mountain ranges lies a wide valley system that trends northwest to southeast. To the east, the rugged Bighorn Range rises to 2500 metres, while the westerly Front Range extends finger-like ridges from 3000-metre peaks into the valleys, along a distance of approximately 40 km. Some of Alberta's most stunning scenery and superior trail riding country straddles the distance between these parallel sets of mountains.

Open and grassy valleys of the Sunkay, Vimy, Wapiabi, George, Blackstone and Chungo Creeks are reminiscent of the Panther Corners-Ya Ha Tinda, only here they are more wild and remote. The Wapiabi-Blackstone is undoubtedly the gentlest landscape in the Bighorn. Valley bottom trails, at least in good weather, pose little challenge for riders because many are abandoned exploration roads and there is little elevation change throughout. Areas of muskeg can prove troublesome for horses though, especially in wet years. With or without horses, the informal camping opportunities in the area are unsurpassed in the Bighorn.

Challenging trails can be found here too, for those willing to explore. Some climb to the top of the Bighorn Range and others ascend Front Range ridges such as Vimy. From high vantages in the Wapiabi-Blackstone, the views are comparable to the most splendid in the Canadian Rockies.

Another feature distinguishes the Wapiabi-Blackstone from the rest of the Wildland – it doesn't have the same level of protection. Because of the possibility of natural gas lying under its surface, the Wapiabi-Blackstone was excluded from the Prime Protection zoning of the Eastern Slopes Policy, and instead given Critical Wildlife Habitat status, a designation that allows industrial exploration and development. A portion at the south end of the Wapiabi-Blackstone, in the drainages of the Sunkay and Terishshner Creeks, is even less protected, and in a large area around Crescent Falls, the zoning allows for general industrial development, including logging.

Despite the lack of protection under the Eastern Slopes Policy, much of the Wapiabi-Blackstone has been quasi-protected since 1986 under Forest Land Use Zone (FLUZ) legislation that prohibits motorized recreation. Even the extensive wetlands of the Sunkay, which are zoned as Multiple Use by the Eastern Slopes Policy, fall under the protective wing of FLUZ law.

FLUZ protection has allowed the Wapiabi-Blackstone to be used in a traditional manner by hikers and horse riders, free from off-road vehicles. This is part of the reason for the area's wild nature and peaceful demeanour. Another reason is that summer use, with the exception of the area around Crescent Falls, has been generally low, although outfitters are increasingly using the Wapiabi-Blackstone for extended summer trail rides. Most of the area's use occurs in the fall when hunters are drawn to seek trophy bighorn sheep and elk in a wilderness setting. Four outfitters currently use this area for extended summer trail rides, and at least six bring hunters into the area each fall.

STEWARDSHIP AND THE HISTORIC BIGHORN TRAIL

In 1994, under a trail adoption program promoted by the Alberta Forest Service, Alberta Wilderness Association assumed maintenance of approximately 100 km of the historic Bighorn Trail through the heart of the Wapiabi-Blackstone. This was the first equestrian trail to be adopted under the program. Each year in July, the Association takes a small group of horse-assisted volunteers into the area for 10 days to carry out work on a portion of the trail.

Adoption of the Bighorn Trail followed 10 years (1984-1994) of volunteer cleaning of debris from trails and backcountry campsites throughout the Bighorn. The clean-up campaign was a joint undertaking between Alberta Wilderness Association and the Alberta Forest Service, who used their helicopters to remove garbage bagged by the volunteers. In 10 years, approximately 20 tonnes of garbage were gathered and flown out.

The Bighorn Trail is at least as old as the Alberta Forest Service and National Parks Service. They jointly built, used and maintained a trail system along the Eastern Slopes as far north as the Athabasca River. There is evidence that the Bighorn Trail between the Kootenay Plains and the Athabasca River was used in prehistoric times. Although little archaeological investigation has occurred in the Wapiabi-Blackstone, First Nations gravesites have been found in several places. It is probable that First Nations peoples followed bison herds dispersing from the Kootenay Plains into the lush meadows of the Sunkay, Wapiabi and Blackstone valleys.

GETTING THERE

Access may be gained from Crescent Falls off Highway 11 or at Wapiabi Gap, west of the Forestry Trunk Road. The Crescent Falls turnoff is reached about 18 km west of the town of Nordegg. A highway sign points west to a local road that can be followed six km to the Crescent Falls campground and staging area. The road to Wapiabi Gap turns west off the North Forestry Road about 15 km north of Nordegg, where it is signed as the Blackstone-Chungo Road. This wellsite road must be followed a further 16 km to the Wapiabi Gap. Blackstone and Chungo Gaps also have old exploration roads leading to the boundary of the Wildland, but vehicle access to these is difficult or impossible.



Some years the number of blown down trees along the historic trail number well into the hundreds. Volunteers use hand saws, axes and chain saws to clear the trail.



Volunteers lay the stringers for a corduroy bridge that was built over a sensitive wetland on the historic trail.



The famous McConnell Thrust fault stopped here and produced a magnificent row of peaks that border the west side of the Wapiabi River headwaters.

Like the Panther Corners-Ya Ha Tinda, the Wapiabi-Blackstone shows evidence of prehistoric use by First Nations peoples. Bison skulls have been found throughout the valleys, as have First Nations graves. One such grave keeps a lonely vigil atop the highest point on the Wapiabi Plains. In the language of the Stoney people, who are the most recent First Nation to use the lands of the Bighorn, the word wapiabi means “grave.”

In the last century, the feral horse has replaced the bison as a primary herbivore within the Wapiabi-Blackstone. Horses that escaped from the nearby Big Horn Indian Reserve have found the area hospitable on a year-round basis and are probably one reason for a healthy population of wolves. Elk are common, although not abundant, probably due to consistent hunting pressure and a lack of suitable winter range. An examination of elk skeletons in the area suggests that many actually live to very old ages and finally die when their teeth are worn to the gum line. Several natural mineral licks, such as that in the headwaters of George Creek, are excellent places to watch for a range of wildlife, including wild horses. Some of Alberta’s most popular bighorn sheep country is found on the high slopes along the Bighorn and Front Ranges, attracting naturalists and hunters.

Although little coal exploration has marred the area, two gas wells were drilled in the Blackstone tributaries of Opabin and Mons Creeks around 1972. Both were dry and their access roads were reclaimed through Alberta’s Heritage Trust Fund. Despite this, the Alberta government has continued to sell petroleum leases in the Wapiabi-Blackstone, and there is increasing pressure from industry to re-enter the area to drill.

Hikers must be warned that the abandoned exploration roads and traditional horse trails in the area were designed for vehicles or horse use, neither of which are impeded by stream crossings. These are frequent on all area trails and caution must be exercised during times of high water. Even equestrians must take care, especially if trying to cross the Wapiabi, Blackstone or Bighorn Rivers when in flood. Equestrians should also be cautious of muskeg, and under no circumstances should they attempt to cross the lower Sunkay meadows or try to ride the Mons Creek wellsite road to the Blackstone River because of the dangerously boggy conditions.



The main Wapiabi stream is joined in this spreading meadow by tributaries from the east and west.

THREATS TO ECOLOGICAL INTEGRITY

Why Protection, Management and Enforcement Are Necessary

- Natural gas drilling
- Increasingly dense drilling on the eastern Wildland boundary
- Logging encroaching on the northern and eastern boundaries
- Increasing ORV activity on the northern and eastern boundaries
- Trapper cabins becoming backcountry lodges; trappers exploiting ORV exemptions
- Increasing horse use, including wagons



The Pharis pack string makes its way across the Wapiabi Valley.



Remains of wild horse corrals in the lower Sunkay Valley.

WILD HORSES

Few North American wild animals can fire the human imagination like the wild horse. It is utterly fascinating to watch a pair of wild stallions face each other on hind legs, ears flattened and teeth barred, lashing out with forelegs and snake-like necks and screaming like banshees. This is especially so when the action takes place in a subalpine meadow where you are camping with your hobbled pack horses who stare, transfixed and on guard, from the protection of a grove of trees. Such an experience is possible in the Wapiabi-Blackstone, where the territorial piles of stallion manure dot the landscape from valley bottom to vertical rock faces.

During the past century, wild horses have been rounded up in parts of the Wapiabi-Blackstone. In the lower Sunkay valley, the remains of corrals with long wing leads can still be found scattered through the forest. One dilapidated corral can be seen along the Bighorn Trail, just where the trail begins to climb steeply from the lower Sunkay meadows to the upper meadows.

In earlier days the horses were rounded up to be broken as working stock, but in later years they were sold to become human and pet food. In 1993 a law was passed in Alberta that restricted the roundup of wild horses, and since then the horses of the Wapiabi-Blackstone have roamed in greater peace. Along with severe winter conditions, wolves provide population control by taking foals.



The Sunkay meadows lie along the eastern edge of the Bighorn Wildland. The boggy meadows are sure to challenge even those with the longest legs!

CORAL CREEK - JOB CREEK



7

VIVIAN PHARIS

CORAL CREEK - JOB CREEK



*Job-Coral is the wild and splendid heart of the Bighorn.
Except for a segment abutting Highway 11, the Job-Coral region of the
Bighorn Wildland lies in grand isolation, surrounded by Jasper National Park,
Whitegoat Wilderness and the Bighorn's Wapiabi-Blackstone.*

*A trip into the area involves a major commitment of time,
energy and careful planning. It is worth it though, as this is one of the last places in
Alberta where wilderness can be experienced much
like it was a hundred years ago.*



These verdant ridges near the headwaters of the Bighorn River form some of the most spectacular scenery in all of the Rockies. Unfortunately, they have now been designated as a snowmobile playground.

CORAL CREEK - JOB CREEK

The main access trail is up Coral Creek, from the signed trailhead just north of the Cline River bridge on Highway 11. Coral Creek valley is so rough that even the 1960s seismic crews were deterred, and except for the first few kilometres above the trailhead, it remains free of roads. Coral is a mean route to travel by foot, with more than 30 crossings of the tumultuous, bolder-strewn stream and enough deadfall to tire a triathlete. Hikers would be wise to remain on one stream bank during times of high water. Camping spots are fairly frequent, particularly in Coral's upper reaches, and most have a good supply of grass for horses. Job Pass, at nearly 2500 metres, is one of the Bighorn's pinnacle viewpoints. Unfortunately, years of passing pack strings have worn away much of the soil from the top of the pass, and the steep route down into Job Creek has become a metre-deep trench.

Before turning into the switchbacks that head out of the Coral Creek valley to Job Pass, the headwaters of Coral Creek beckon the adventurous into a lake-studded alpland of incredible beauty. For hikers equipped with the gear and skills for further adventure, it is possible to cross several high passes at the top of Coral Creek and descend to McDonald Creek within White Goat Wilderness, or into Job Creek and over another high pass to upper Job Lake.

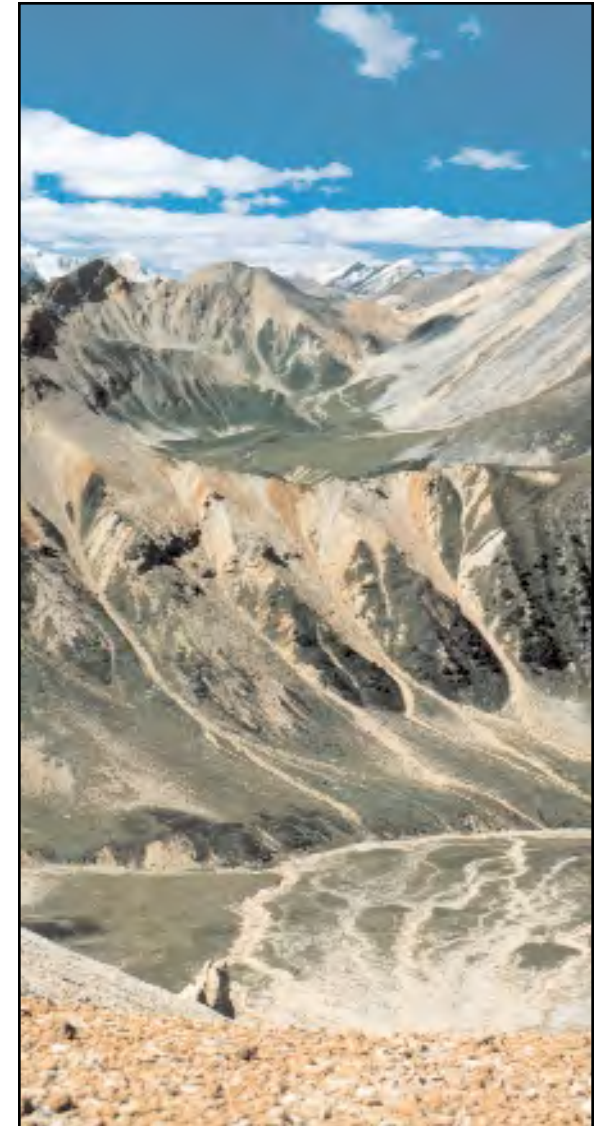
Once back on the main trail and over Job Pass into Job valley, a choice can be made to proceed upstream or down, although the established trail leads down and there will be no obvious camps above this junction. Upper Job is well worth a long day's toil on foot though, to immerse yourself in picturesque mountains, stunning waterfalls and

valleys choked with massive limestone blocks, each beckoning investigation, just beyond. This is not a valley for the timid, nor for those lacking mountain travel experience, but it offers some of the Bighorn's wildest and best scenery.

Downstream, along Job's main trail, each side valley could be a day's adventure. Some tributaries lead into high, hanging valleys that drop into Job Lake. Some end in impossible-looking passes, where indented trails indicate the ease with which bighorn sheep and mountain goats move between Job Creek and the drainages of the Wapiabi, Bighorn and Littlehorn Rivers. Outfitter camps are scattered along Job Creek, although some are no longer useable because of the fickle nature of the creek, which erupts to the surface or disappears underground at different places in different years.

Job Lake, named for Job Beaver, a renowned Stoney mountain man and explorer, is the Bighorn's most photogenic lake. It is set amongst snow-crested, red-streaked peaks, where long green slopes fall into deep blue waters. By horse, Job Lake is a day's ride west of Job valley, about seven km along the full length of Wilson Creek.

For more than a decade, fishing for cutthroat trout in Job Lake was an angler's sweetest dream. There was no finer fishing anywhere in the province, and the chance to catch a five-pound species-pure cutthroat with bright pink meat became a sportsman's magnet. Finally, the insatiable fishing industry trade triggered the fishery's collapse and the lake has been closed to anglers since 1989. A mudslide into the spawning beds at the Wilson Creek outlet has thwarted natural recovery of the population. A positive but slow outcome of the fishery's closure has been the recovery of the damaged lakeshore's ecology.



The vivid colours of Upper Job Creek indicate its proximity to the iron-rich mountains of Jasper Park.



About 10 km above its junction with Job Creek, one branch of Three Whisker Creek tumbles over a craggy falls. The rest of the day's exploration of upper Whisker is on foot; the terrain above the falls is steep and rough.

Downstream of the trail to Job Lake, camping and side valley exploration opportunities continue. Obstruction Lake to the west is a diamond cast in a rough rock setting, a setting that is often softened by a herd of placid bighorn lambs and ewes lounging on its alpine shores and by the splash of trout on the lake's surface. This lake requires a considerable hike or ride even to the first "obstruction," or set of cliffs. Horses must be tied here, as they can go no further. Two lesser but still obstructive sets of cliffs must be assailed before the turquoise waters of upper Obstruction Lake break into view.

Nearer the mouth of Job Creek is another long, enticing valley with the whimsical name of Three Whisker. This valley comes from the east and splits into several "whiskers" in its upper reaches. Each whisker valley is itself an individual, with its own rugged beauty. To get to know this Job tributary well would require several days of exploring.

At the mouth of Job Creek, another decision must be made to go up or downstream, this time following the east bank of the Brazeau River, next to Jasper National Park. Either direction means several days of travel to the nearest road. Continuing a trip from the junction of Job Creek and the Brazeau River requires careful planning and the prior positioning of pickup vehicles.

Downstream, travellers are faced with a tough day along a combination of cut horse trails and seismic lines that are now designated for off-road vehicle use. The trails are soft in many places and the occasional muskeg bog has to be crossed. In summer, the no-see-em flies can drive horses mad along this stretch. After approximately 15 km, the horse trail leaves the Brazeau and enters the more hospitable and vehicle-free Blackstone valley at the

north end of the Wapiabi-Blackstone. From here, trails can be followed within the Bighorn Wildland to Wapiabi Gap or Crescent Falls.

Upstream, travelling and the scenery are far more pleasant, and this part of the Brazeau is off-limits to motorized recreation. Again, there are several good camps along the way, such as the one below the trail to Longview Lake. With planning and the correct permits, a wonderful route can be followed upstream and across the Brazeau River into Jasper Park, and on out to Highway 93 over Nigel Pass and along Nigel Creek. Crossing the Brazeau River is a challenge for hikers, however, and should be attempted only by those experienced with river crossings, and only when the river is low.

Arising in the southeast corner of the Job-Coral section is the crowning glory of the Bighorn Wildland. Here are high, expansive and flower-strewn meadows where streams rush, waterfalls plunge and the sheep, goats and fat marmots feed lazily in plain view. Golden eagles catch the thermals, and even a rare wolverine may play hide-and-seek with a golden-mantled ground squirrel. Elusive alpine poppies are at home here too, on soft shale slopes at about 2600 metres. These are the highlands of the Littlehorn and Bighorn Rivers, where the waters originate amongst a myriad of rock towers and snow-clad peaks, just east of Job and Coral Creeks. Few places in the Rockies are as fair of view or as inviting to linger in as the upper reaches of the Littlehorn and Bighorn Rivers.

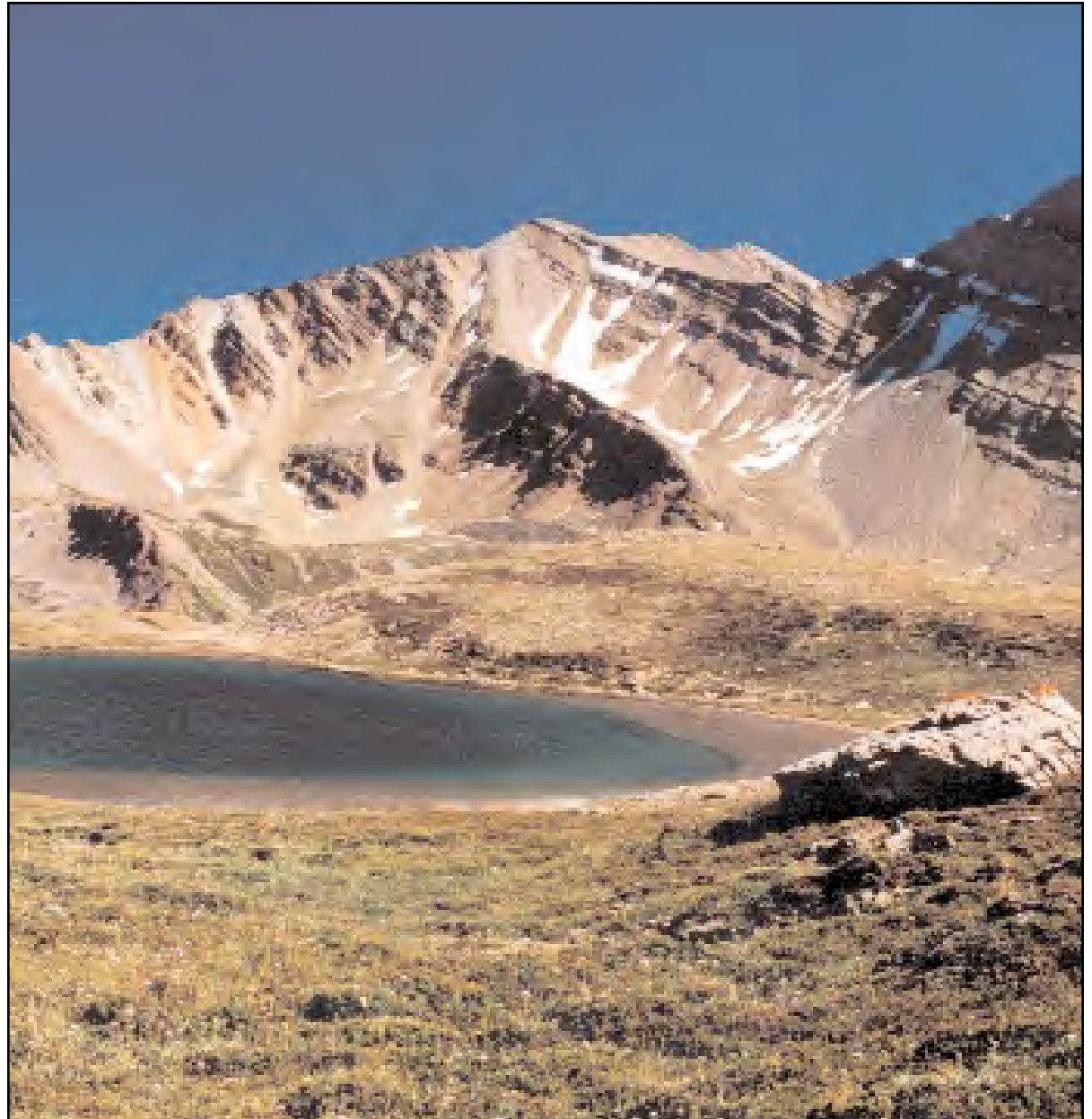
RARE AND LOVELY LAPLAND ROSEBAY

Canada's Rocky Mountains have only two species of rhododendron, the gangly white-flowered variety and its astounding little cousin, the royal purple Lapland rosebay. Lapland rosebay is a low, tangled shrub that blooms in a show of purple azalea-like cups right at the time of snowmelt. An inhabitant of Canada's arctic, this small plant is also established in scarce pockets along the Eastern Slopes, particularly in the Bighorn Wildland, and most particularly in certain treeline locations throughout Job-Coral and the Wapiabi Front Range.

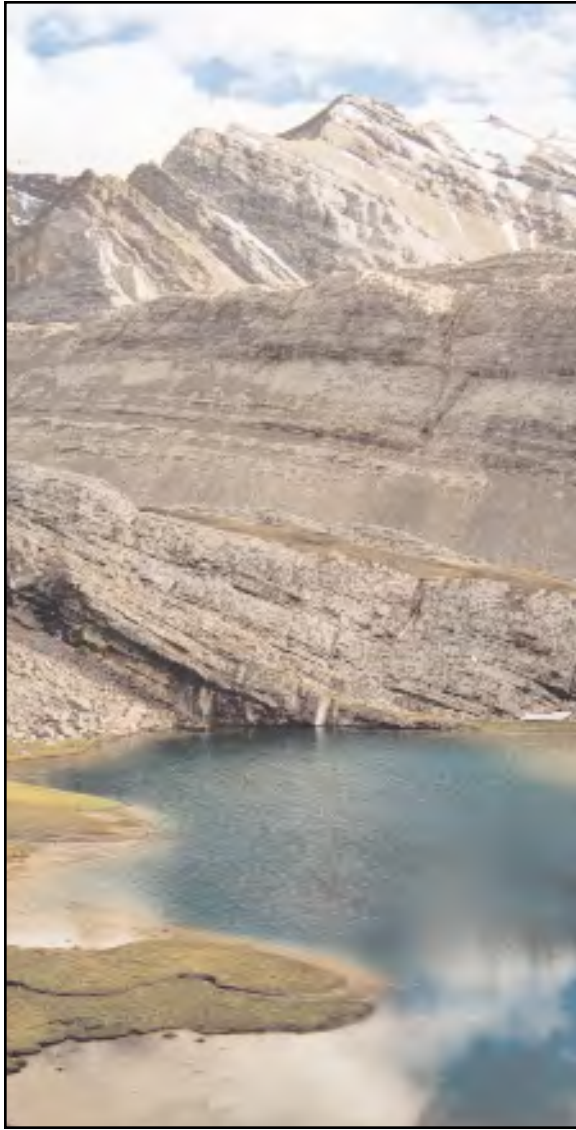
Most people would fail to notice this shrub unless they happened to see its exotic blooms during the last week of June or the first week of July. In places, as on the slopes east of Job Lake or on the top of the lowest obstruction on the route to Obstruction Lakes, Lapland rosebay is locally common but often goes unnoticed amongst the heather species growing with it.



Lapland rosebay in royal purple splendour – a rare treat seldom seen.



The headwaters of Coral Creek arise from a series of exquisite alpine tarns.



Nestled among high peaks and surrounded by cliffs, Obstruction Lake is a challenge to reach, but well worth the effort.

Trails into these alpine meadows ascend both rivers, and another climbs over Littlehorn Pass, up Whitegoat Creek, from the waste transfer site off Highway 11. All, unfortunately, are the remains of exploration roads, and this place of beauty and tranquility has been scarred by the search for minerals. The road scars will linger as reminders of an era when wilderness was considered infinite and without value, except for its extractable resources.

From Crescent Falls off Highway 11, a trail follows the Bighorn River upstream to its junction with the Littlehorn River. Beyond this junction, both valleys have trails suitable for horses, although only hikers will be able to make the final ascent over Bighorn Pass into the top reaches. It is too steep for horses. The valley of the Littlehorn is long and rocky before it passes through a tight notch made by a recent landslide and begins a brisk ascent. The way is an old exploration road that in places is being narrowed to a trail by slumping soils. Both river valleys are flanked by intriguing tributaries that are full of surprising delights for those who have the time, energy and experience to explore them.

Although the highly scenic meadows at the top of the Littlehorn-Bighorn are officially off-limits to summer recreational vehicle use, they have recently

been designated as a general winter playground, with the access trail being up Whitegoat Creek and over Littlehorn Pass.

The Job-Coral region is known for its vigorous population of bighorns, and the strongest population of mountain goats in the region is found in this remote area. Elk and moose numbers, however, are well below summer carrying capacity. Grizzly and black bears and wolves are found throughout. During late August and early September, at the height of buffalo berry ripening, bears may concentrate along such trails as lower Coral, and hikers must be alert at such times.

Job-Coral supports three summer trail-riding outfitters who are equipped to take tourists on extensive tours. The Sands (now retired), McKenzie and Colosimo families have a long association with Job-Coral and have been bringing trail riders and hunters to the area for two generations. Several spring bear outfitters and fall outfitters guide foreign and resident hunters seeking trophy bighorn rams and elk. There are few other places where hunting, for bighorn sheep in particular, is still possible in such wild and spectacular settings as those of the headwaters of Job-Coral and the Bighorn-Littlehorn.

THREATS TO ECOLOGICAL INTEGRITY

Why Protection, Management and Enforcement Are Necessary

- Impact of off-road vehicles along the Brazeau River and in Jasper National Park
- Impact of snowmobiles on wildlife in the valleys and highlands of the Littlehorn and Bighorn Rivers
- Snowmobile compaction damage to soils, plants and small mammals wintering under the snow
- Impact of helicopter tourism on wilderness qualities and on fish and wildlife populations
- Trail erosion, especially over Job Pass



Ridges and open slopes at the top of Coral Creek provide excellent bighorn sheep habitat and the haunt of isolation-seeking grizzly bears.

CLINE RIVER



VIVIAN PHARIS
CLINE RIVER



The most rugged portion of the Bighorn Wildland lies in the region of the Cline River. Bordered by the White Goat and Siffleur Wilderness Areas, Banff National Park and the North Saskatchewan River, the Cline region is almost a separate entity from the rest of the Wildland.

High glaciated peaks, striking alpine lakes, abundant waterfalls, open foothills slopes and serpentine river valleys make this an especially scenic recreation area and one with a long history of use and appreciation.



The rewards of wilderness camping in the Cline River area include waking to the crystal waters of Landslide Lake.



Above Landslide Lake a backpacker continues to ascend to the 2500 metre saddle before dropping steeply into Wildhorse Creek toward the David Thompson highway.

CLINE RIVER

Vehicle access to the Cline region is limited to two points off Highway 11. One begins at the Pinto Lake trail staging area south of the Cline River bridge, and the other is about eight km. to the west, at the junction of Highway 11 and the Wildhorse Creek trail. Foot travellers have more choice, however. They can enter the Cline region from several Siffleur and White Goat Wilderness Area trails, such as those following Cataract and McDonald Creeks. The Sunset Pass trail from Highway 93 in Banff Park is one of the most popular hiking trails into the area. This trail climbs in a series of switchbacks up Norman Creek and past Norman Lake to the pass and park boundary, where views can be glimpsed of Pinto Lake, an azure mirror circled by dark green forest against sheer, limestone cliffs.

Even prior to the old “four-wheel drive only” forestry road along the North Saskatchewan, which was the forerunner of Highway 11, recreational use of the Cline region was relatively high. In 1966 when the road was upgraded to all-weather standards, use continued to increase. Hunters, fishermen and mountaineers came to enjoy the area’s special attributes. Glaciated Mount Cline, the Bighorn’s tallest peak, rises to just over 3300 metres, and nearby peaks like Whitegoat and Resolute are over 3100 metres. Such peaks have long been a draw to the mountaineering fraternity.

Traditionally, fishing has been another major recreational use. Pinto Lake’s phenomenal population of bull trout seemed inexhaustible and attracted outfitters and private parties for decades. First Nations use dates at least to the earliest recorded history of the area. But when they are abused, all good things end, and increasing fishing pressure caused population depletion, which forced the lake’s closure in 1989. Due to the slow population recovery, there are no current plans to reopen the lake to sport fishing; this will allow the lake’s shores to recover from decades of random camping.

The story of Pinto Lake’s fishery collapse is being repeated in nearby stocked lakes. These are the much smaller Landslide Lake and Lake of the Falls, stocked with cutthroat trout, and Michele Lakes, stocked with golden trout. All three are suffering from the combined effects of under-attention by a resource-strapped government agency, too much attention by foot- and horse-powered anglers and, since 2000, the added pressure of helicopter fishing.

The Cline section of the Bighorn Wildland used to be known for its remnant herd of rare mountain caribou that wandered through these and neighbouring lands in Banff Park and the Siffleur and White Goat

Wilderness Areas. Today there is scant evidence of the noble beast anywhere in the region. Parts of the Cline region, including Pinto Lake and Cataract Pass, are key mountain goat ranges. Bighorn sheep make Landslide Lake and other high and grassy slopes their summer homes. Grizzly and black bears have traditionally frequented the vicinity of Pinto Lake, probably because of lush vegetation along the lake's shores and meals of bull trout from the lake's outlet. The effect of increasing helicopter traffic on local wildlife has yet to be assessed.

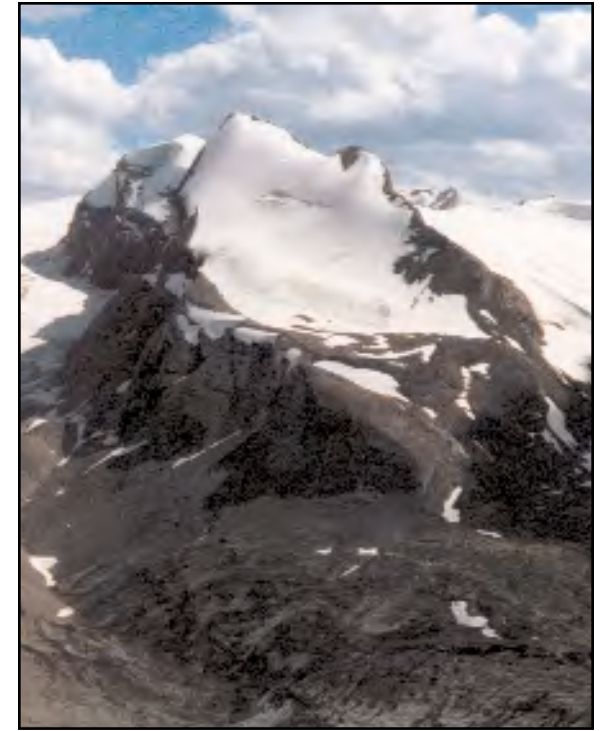
Only two main horse and foot trails traverse the Cline region. One follows the north boundary, along the south bank of the Cline River to Pinto Lake, where it connects park and wilderness area trails with the Highway 11 staging area south of Cline River Crossing. The other trail leaves the Cline River about five km. upstream, to climb steadily to Landslide Lake. This trail traverses a 2500-metre pass before descending steeply down Wildhorse Creek to Highway 11. A trail branches west from the Landslide Lake Trail to Lake of the Falls and its outstanding scenery. An informal hiking trail follows closely along the banks of Waterfalls Creek, and a horse trail takes a longer route through the forest to lovely Michele Lakes, which are almost on the Banff Park boundary.

Portions of the trails to Michele Lakes, Lake of the Falls and Landslide Lake now fall into a restricted category that permits horse travel only between October 1 and May 30. These restrictions are an attempt to allow recovery of deeply eroded sections and to remove pressure during wet weather conditions.

Since the 1960s, the area's mountains have been surveyed for potential ski developments, and the Saskatchewan River valley has been researched for potential resort sites. Various proposals for each have

come forward throughout the years, some eliminated by the Eastern Slopes Policy zoning and others by the designation of the White Goat and Siffleur Wilderness Areas. The public, in a prolonged and concerted effort, was successful through a 1984 decision by the Alberta Court of Appeals in defeating the grandiose Odyssey Resort proposed near Cline River Crossing. Today, the 700-hectare Whitegoat Lakes Development Node north of Cline River Crossing, an area described in government documents as sensitive and suitable for low-impact development, contains the modest David Thompson Resort, McKenzie's trail-riding concession, Aurum Lodge, an unobtrusive ecotourism venture, and the Icefield Helicopters staging area, and is available for further development.

In 1999 Icefield Helicopters was given county approval to locate a base at the mouth of the Cline River; since then, they have steadily increased the number of helicopters, number of flights per day and flight times from dawn to dusk. These flights are having a growing effect on wilderness recreation and the peace and solitude of the Cline region, the Kootenay Plains and the Columbia Icefields of Jasper National Park.



Mt. Wilson within Banff Park and its extensive icefields can be seen from high elevations throughout the Cline area.

THREATS TO ECOLOGICAL INTEGRITY

Why Protection, Management and Enforcement Are Necessary

- Impact of helicopter tourism on wilderness qualities and fish and wildlife populations
- Increased tourism development along the North Saskatchewan River
- Trail erosion on steep slopes
- Over-fishing



An old horse camp at the junction of Vimy and Wapiabi Creeks shows severe damage from horses tied to trees for extended periods. Forty-seven standing trees are suffering from root damage. In 2003 AWA pulled and burned several armloads of exotic weed from this site. The site contains more than a dozen campfire scars. A camp like this should be officially closed for at least five years in order to rehabilitate.

REDUCING THE IMPACT OF HORSE USE

In Chapter 18, Don Wales describes low impact backpacking in high elevation, sensitive sites. As horse use increases, equestrians too, must become more cognizant of their impact on the landscape. Trail proliferation and erosion are becoming major management problems in parts of the Bighorn and are not being adequately addressed. Most such problems are within a day's ride of trailheads and favourite campsites, such as Hummingbird at the junction of the Ram and Hummingbird Creeks, at the Clearwater and Panther Corners trailheads and in the vicinity of Ya Ha Tinda Ranch and the Panther Corners. Care must be taken to keep horses to single trails and to avoid cutting switchbacks and indenting new trails down steep slopes.

Generally, horse camps are located in lower elevation valley bottom sites that are often less sensitive than sites backpackers might choose. Indeed, Europeans have used some horse camps in the Bighorn continuously for the past 100 years and possibly First Nations peoples have used them for a longer time. Some of these show remarkably little damage except for the inevitable woodcutting. Other backcountry sites, however, do show soil compaction, weed growth, a proliferation of fire rings and tree root damage from horses left tied to trees. Such camps need management attention and closure on a rotating basis in order to allow rehabilitation.

Established outfitters often have favourite semi-permanent backcountry camps that are assigned to them by the Forest Service, and they are responsible for maintaining these sites. When such camps are used for extended periods, supplemental feed that

may be hauled or air lifted in can bring exotic weeds that establish themselves. The availability of natural forage is a limiting factor for horse camps. In the past, First Nations peoples would have freely used fire to create good grazing for both wildlife and horses around their traditional camp. Outfitters, too, are reputed to have managed wildlife habitat and their campsite grazing with fire. Today, however, fire is largely suppressed, and much of the open valley grazing sites associated with old horse camps are now overgrown with dwarf birch and willow. There is a need to return to prescribed fire management of habitat and grazing sites for recreational use and to reduce the need to pack in horse feed.

Common Sense Horse Use:

- Keep to established trails, avoid braiding, cutting switchbacks and trail proliferation.
- Avoid tying horses to trees, especially for extended periods. Use high picket lines between trees or allow horses to roam on hobbles.
- Camp back from creek banks.
- Bring a shovel to scatter manure.
- Avoid proliferation of fire rings – use gas stoves or clean up and reuse established rings.
- Rehabilitate your fire ring by removing rocks, scattering cold, wet ashes and throwing on a couple of scoops of mineral soil followed by a couple of scoops of organic soil to encourage new growth.
- Camp only a night or two in one spot and leave the site clean and tidy.
- Keep horse numbers to a minimum. Generally one packhorse is adequate per rider, for a weeklong trip.
- Pack out all non-burnable garbage.
- Pick and burn any weeds and bring only weed-free supplemental feed.



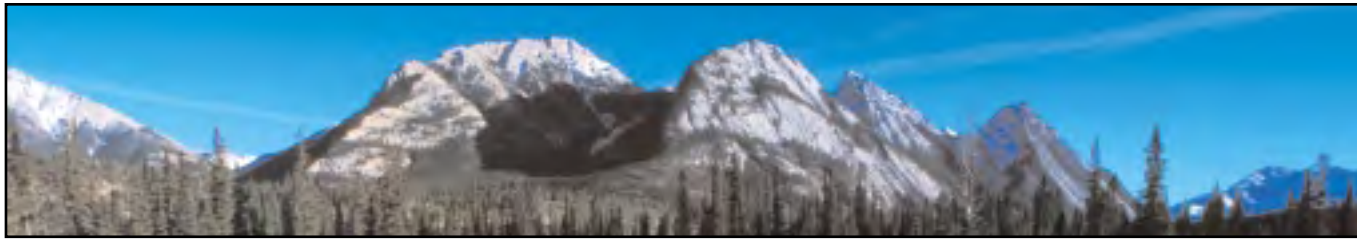
Mountaineers have been drawn to the challenging Cline River area peaks since the early 1900s. The area contains the Bighorn's highest peaks.

KOOTENAY PLAINS ECOLOGICAL RESERVE



DOROTHY DICKSON & JULIA COOK

KOOTENAY PLAINS ECOLOGICAL RESERVE



A long natural corridor extends from the Columbia River drainage in British Columbia, over the Howse Pass on the Continental Divide, to the North Saskatchewan River drainage in Alberta. The trail along its length passes spectacular mountain scenery, glaciated valleys, turbulent streams and dark forests, but the landscape changes abruptly where the North Saskatchewan River emerges from the confines of the Front Ranges of the Rockies about 14 km from the eastern gate of Banff National Park. Here the river flows out into the broad, grassy Kootenay Plains of the Montane ecoregion.



The four seasons bring fresh delights to the Kootenay Plains. The winter ice on Abraham Lake provides a broad and fascinating study of Nature's artwork.

KOOTENAY PLAINS ECOLOGICAL RESERVE

To the south and east of the Plains is the North Ram River drainage and to the north and west, the rugged Cline River region. As the North Saskatchewan River valley continues eastward, the land becomes heavily forested, and the Montane area, the only one in this part of the Bighorn Wildland, ends.

The typical Montane ecosystem of grasslands interspersed with stands of trees is warmed and dried here by the chinook winds blowing through the Howse Pass. Indeed, the aboriginal name for the area was Kadoona Tinda, meaning the “Windy Prairie.” With its thin, fragile layer of sandy soil, the region is almost desert-like and very susceptible to wind and water erosion. Unlike in the montane grasslands further south, the grasses here are June grass and northern wheatgrass rather than fescue. It is speculated that fescue grasses may once have grown here but were destroyed by overgrazing. The grasses are interspersed by typical montane forbs such as pussytoe, strawberry, yarrow and aster. The trees are mostly lodgepole pine with some white spruce, Douglas fir and, on exposed rocky ledges, limber pine. Because it is so dry, there are few stands of aspen, but willows grow in some riparian areas. Canada buffaloberry and wild roses are common shrubs. Low-growing species such as bearberry and creeping juniper help to hold the vulnerable topsoil in place.

Since the cutting of trails in the forests to the east, access to the Kootenay Plains from both west and east has been reasonably easy for both wildlife and humans. For thousands of years the grasslands have been a major wintering ground for hoofed mammals, especially bison, elk and mule deer.

Groups of woodland caribou used the wooded areas, while the bighorn sheep and mountain goats stayed on the fringes to be close to their escape routes to higher land, as the congregations of prey were naturally followed by their predators, mainly wolves and humans.

Many Kootenay people lived on the Eastern Slopes, and others from British Columbia joined them for the winter. When the fur traders, such as David Thompson and Joseph Howse, came from the east in the early 1800s, they named the Plains after the inhabitants they found there. However, various Alberta-based First Nations, by now supplied with horses and guns, drove all the Kootenays back into British Columbia to keep the good hunting and lucrative fur trade for themselves. It was the Stoneys who eventually settled permanently in the area and in 1910 were promised land there – a promise that remains unfulfilled.

Horses were added to the teeming populations of wild winter grazers, which were under such heavy hunting pressure that the bison were extirpated and other species greatly reduced in number. As trading posts, forestry and mining enterprises multiplied and roads crept westward, people started coming to visit the Kootenay Plains for recreation, and the number of visitors continues to increase to this day.

Since Highway 11, the David Thompson Highway, was paved and extended to the Banff Park boundary, many more people have been able to explore and enjoy the Kootenay Plains in all seasons. But what you see today, while still beautiful and interesting, is very different from the sight of grasslands teeming with wildlife as they once were. Now you will see a flooded valley bordered by the remnants of the Plains.

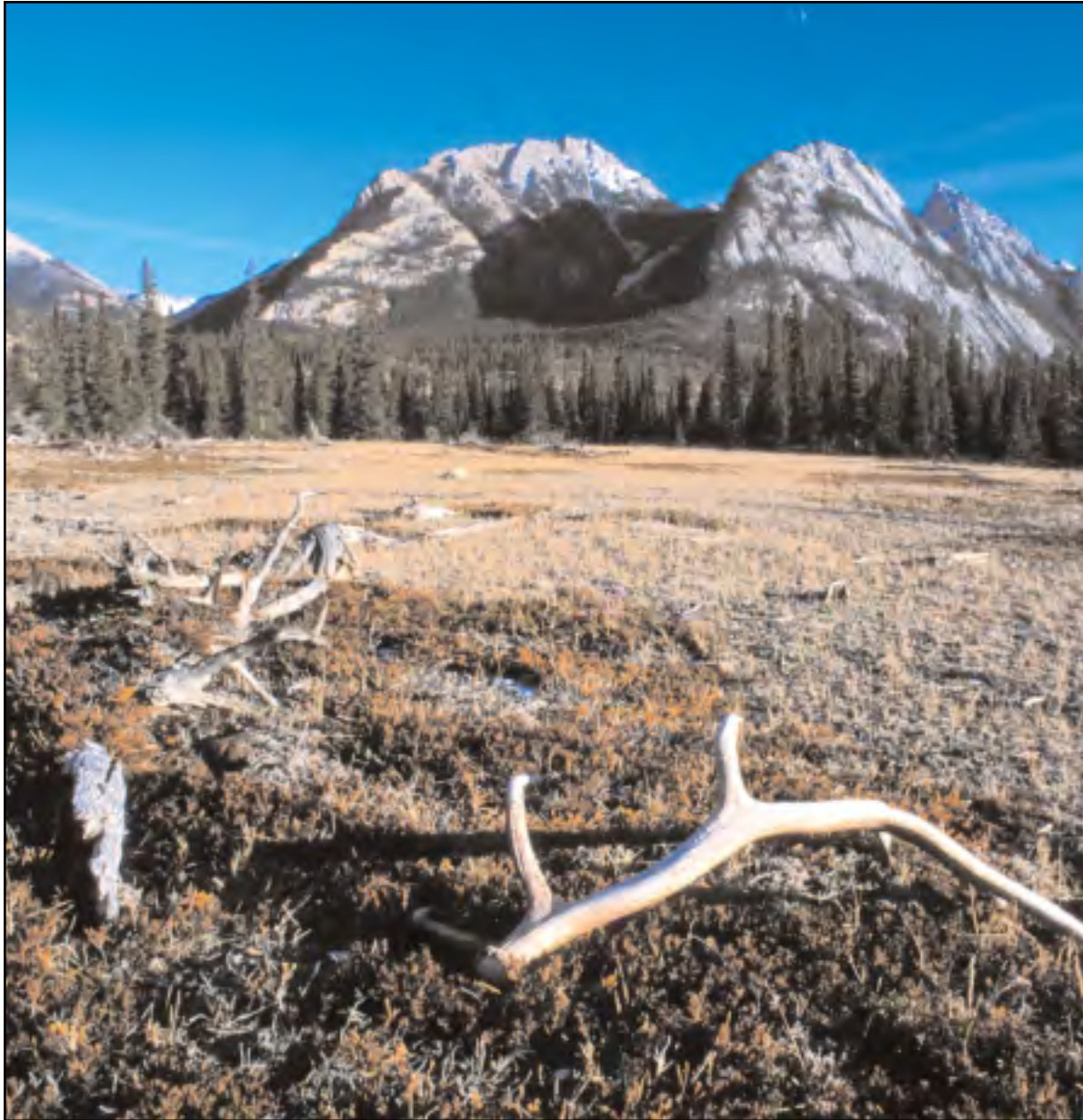
Construction of the Bighorn Dam near the confluence of the Bighorn and North Saskatchewan Rivers was completed for hydroelectricity in 1974. The long reservoir was named Abraham Lake after Silas Abraham, patriarch of the Stoney Abraham family, who lived on the Plains for more than 150 years and whose homes and gravesites are now under the water.

While the reservoir has flooded valuable wildlife grazing lands and displaced the First Nations from much of the land they were once promised, it has enhanced the views of the surrounding mountains by the ever-changing colours of the water and the reflections of the convoluted rock formations that tower above it. It is not, however, as was once hoped, of use for recreation because of the dangerous winds, and the shoreline is too sterile to create habitat for wildlife because of the fluctuating water levels.

Many trails start from Highway 11 and lead through the Kootenay Plains to more rugged country beyond; these are well described in trail guides for the area. However, there is also much of interest easily accessible within the Plains themselves. At Whirlpool Point on the south side of the road, limber pines cling to the rocky, windswept ledges. Many of these trees are at least 400 years old and some are estimated to be nearer 1000 years. Their slow growth and constant pressure from the prevailing winds cause them to grow in a spiral, turning very, very slowly from the force of the mono-directional winds. The eastern end of the Plains has one of the largest natural stands of Douglas fir on the Eastern Slopes. This is one of the easiest evergreens to identify – just look for the “mouse-tails” sticking out from between the scales of the large cones.



A three-toed woodpecker feeds his noisy brood in a cavity in one of the Kootenay Plain's old trees. The Plains are home to a wide range of animal and plant species, including one of the largest stands of Douglas fir on the Eastern Slopes.



Antlers shed on the Kootenay Plains testify to the area's use by ungulates in the fall and winter. Prior to Abraham Lake's flooding, the Plains over-wintered large herds of wildlife and was permanent home to generations of First Nations peoples.

Interesting features north of the highway can be accessed from the campgrounds. Two O'clock Creek got its odd name because early in the morning in the summer there is little or no waterflow in this creek, which runs east of the campground named after it. However, by mid-afternoon, the sun has caused the edge of the glacier that feeds it to melt, giving the creek a good waterflow – so if you want to get across you had better be there before two o'clock! The ridge behind the campground is worth exploring, with delightful views over the valley and many wildflowers and nesting birds in early summer.

You can continue upward to the alpine zone on Two O'clock Ridge or stay on the easy slopes and see the First Nations sweat lodges, built each year for traditional sundance ceremonies. Near the Cavalcade Group Camp, a large ice-wall forms in the winter. This is not a frozen waterfall but an "ice-fall" formed by small seeps and trickles on the cliff face from the slightly sulphurous springs above that never freeze.

Recognizing that this is one of the few montane areas in the foothills and that it has features not found elsewhere, making it a place to be protected and cherished, the provincial government designated much of what is left of the Kootenay Plains as an Ecological Reserve in 1987. Most of the low land along both sides of the highway is included, but the major part of the Reserve lies east of the road. The parking area and access is 62 km west of Nordegg and has a good on-site map showing the trails beyond.

The primary purpose of the Ecological Reserve is to protect the natural features of the Montane ecosystem. However, because the region had long been used for recreation and – unlike most such reserves, which are more isolated – was much used by the public, it was decided that strictly regulated horse riding and mountain biking would be permitted. Three established trails were designated for these uses, mainly to provide access to traditional routes leading further south. Unfortunately, these privileges are being abused and off-trail damage to the fragile soil cover is increasing. If the native plants recover at all, it will take many years, and opportunistic plants such as chickweed often invade the disturbed areas.

The most popular hiking trail is to the Siffleur Falls. It takes visitors through several different areas typical of the Montane zone. The flowers, especially the calypso orchids of spring, and the more than 60 species of birds, including bluebirds and several species of both swallows and woodpeckers, are a joy to see and hear. The trail passes near the spectacular gorge of the Siffleur River, named after the siffleurs, or “whistlers,” a nickname for the hoary marmots found in the mountains of its headwaters. The Falls themselves are picturesque but deceptively dangerous. Visitors are wise to stay behind the barriers.

The Kootenay Plains may hold just a small fragment of the wonders of the Bighorn Wildland, but they hold more of our natural and human history than most other areas. Wherever you go in this precious place, tread lightly, with respect for the past and with hope of preserving it for the future.

THREATS TO ECOLOGICAL INTEGRITY

Why Protection, Management and Enforcement Are Necessary

- Overuse of the fragile areas
- Non-compliance with regulations in the Ecological Reserve
- Lack of financial and human resources to monitor the effects of use and enforce regulations
- Overflights by helicopters from a tourist operation east of the Kootenay Plains



Before damming and flooding of the North Saskatchewan River, the Kootenay Plains was one of Alberta's most outstanding examples of the rare Montane ecological region. Today most of what is left of the area's Montane is protected as an Ecological Reserve.

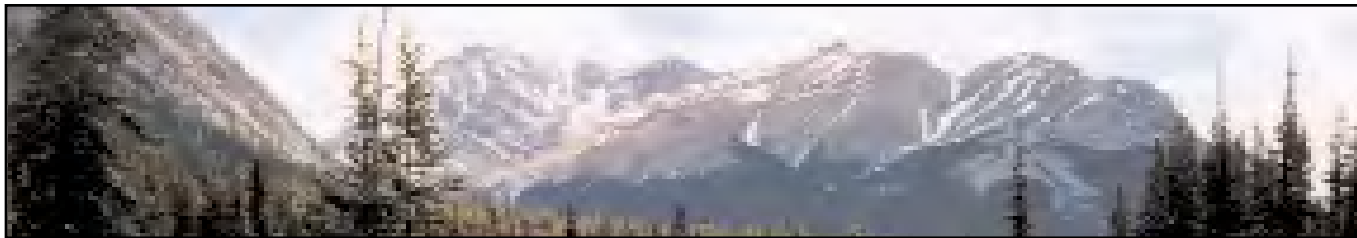
SIFFLEUR WILDERNESS



10

DON WALES

SIFFLEUR WILDERNESS



At 254 sq km, the Siffleur Wilderness Area is small by wilderness standards, but it contains some of the most spectacular scenery in the Eastern Slopes. Like the White Goat and Ghost Wilderness Areas, it is protected by the Wilderness Areas, Ecological Reserves and Natural Areas Act, which prohibits vehicle access, helicopter access, hunting, fishing and trapping. It is a “benchmark” wilderness or “living museum,” where collecting plants, fossils and artifacts is illegal without a permit. Much of the Siffleur is more than 2800 metres above sea level, and it contains the headwaters of Porcupine, Escarpment, Loudan and Spreading Creeks. The Siffleur River bisects this wilderness area from its headwaters at Pipestone and Dolomite Passes.



Once in Spreading Creek meadows, the towers of Mt. Murchison reward hikers who have scrambled and bushwhacked up a taxing route from Highway 93.

SIFFLEUR WILDERNESS

The Siffleur's boundaries are relatively indistinct. The west and much of the south are bounded by Banff's eastern boundary; the north by an imaginary line approximately four km south from the North Saskatchewan River; the east by a rugged range of peaks separating Siffleur from the Whiterabbit Creek drainage; and an indistinct part of the southern boundary is near the confluence of Dolomite Creek and the Siffleur River.

Fortunately for the Siffleur, access is difficult, requiring several days of hiking, a high level of fitness and knowledge of wilderness travel. Existing trails can be blocked with deadfall, and other means of access are simply routes. Some original horse trails were abandoned when seismic exploration lines were cut through valleys in the 1950s and 1960s. Most of these lines have become impassable due to deadfall and erosion, leaving the area with few established trails. The suggested entry points listed here are in ascending order of difficulty.

- Probably the easiest access is over a pedestrian swing bridge, which crosses the North Saskatchewan on a trail from the Siffleur Falls parking lot on Highway 11. An abandoned logging road parallel to the Siffleur River soon degenerates into an exercise in deadfall dodging due to a 1974 forest fire. At about 18 km from the trailhead, a trail branches to Porcupine Lake and beyond. Guidebooks suggest it is possible to access the lakes at the headwaters of Escarpment Creek, but this route is reported to be difficult because of deadfall. This access to the Siffleur is entirely valley bottom with restricted views.

- A more spectacular access from the south begins at Highway 93 and follows a trail past Helen and Katharine Lakes, over Dolomite Pass and past Isabella Lake to the south boundary. This trail is good all the way but the area is popular with grizzlies and is sometimes closed. To camp along the way requires a national park wilderness permit. A longer access from the south would be 29 km from Lake Louise over Pipestone Pass; alternate routes from Fish Lakes or Devon Lakes are described in detail in Banff Park trail guides.
- A spectacular but exhausting route from Highway 93 is up Totem Creek. The trailhead is near Waterfowl Lakes and involves a tough bushwhack and scramble over a high tight pass into the alpine meadows of Spreading Creek. A truly alpine route connects Totem Creek with Noyes Creek, also off Highway 93, and a steep descent eastward will take you to Porcupine Lake.

A recommended area to linger is the campsite at Porcupine Lake, but for a truly alpine experience and to see the very best of the beautiful Siffleur, nothing beats Spreading Creek's meadows. The Totem Creek access features exquisite alpine lakes, a spectacular view of Mount Chephren and its massive towers, and the hanging glaciers on the backside of Mount Murchison. Days could be spent enjoying the alpine flowers and exploring nearby ridges, waterfalls and canyons. Bighorn sheep are found here and it may well be one of the last southern refuges of the mountain caribou. I have never seen grizzly sign here, but I am sure they pass through. Bird life, as in the White Goat, is typical of alpine areas. Snowfields persist here well into late summer, if they melt at all. A rough alpine route to Noyes Creek or east to Porcupine

Lake provides perhaps the best overview of the eastern Siffleur, as well as breathtaking views west to Howse Peak and the turquoise jewels of Mistaya, Cirque and Chephren Lakes.

Wilderness Areas permit only foot travel, and due to the distances involved, backpacking is required. Care with disposal of human wastes, protection of water sources and minimum impact camping are essential to protect this fragile environment. Fires are discouraged except for emergency purposes, as firewood is at a premium in the alpine. Following these simple common-sense rules, a well-prepared backcountry hiker can expect a wilderness experience second to none.



Vistas of towered peaks, including Chephren and Murchison, unfold from a fall camp in Spreading Creek meadows at the heart of the Siffleur.



Siffleur Falls is reached in an easy day hike across the Kootenay Plains.

WHITE GOAT WILDERNESS



11

DON WALES

WHITE GOAT WILDERNESS



Quietly tucked along the eastern boundary of Banff National Park and the southern boundary of Jasper National Park is one of Canada's best kept wilderness secrets: the White Goat Wilderness. This benchmark wilderness area was protected by the Provincial Wilderness Areas Act in 1960, at which time it comprised 1259 sq km. In 1971, when the Act was changed, it was reduced in size to 445 sq km.

Much of the area removed is described in the chapters on Job-Coral and the Cline River.



The Cataract Creek trail that bisects the western half of the White Goat passes by such notable Banff Park boundary peaks as Cirrus Mountain, shown here.

WHITE GOAT WILDERNESS

White Goat's wilderness values are protected by legislation, which prohibits entry by vehicles, aircraft and horse, while its wildlife is protected by bans on hunting, fishing and trapping. It is also protected by its isolation. Access is difficult, involving a high level of fitness, experience in wilderness travel and route-finding skills using map and compass.

The western boundary is a series of spectacular national parks peaks of over 3000 metres. The northern boundary is the upper Brazeau River and Jasper National Park. A rugged line of peaks that separates Coral Creek drainage from McDonald Creek constitutes the eastern boundary, and the Cline River, the southern boundary.

Getting to the heart of the White Goat is an experience in itself. Listed in increasing order of difficulty are these access routes:

- For a tantalizing taste of the western Cataract Creek portion of the White Goat, take established trails from Highway 93 to Norman Lake, Sunset Pass and Pinto Lake. From Pinto Lake, a passable 13-km trail parallels Cataract Creek to the alpine meadows of Cline Pass. An alternate access to the same point leaves Highway 93 and traverses to Nigel Pass and on to Cataract Pass, but involves some off-trail hiking and an elevation gain of 595 metres. A route to a less spectacular view of the White Goat's southern boundary starts from Cline River Crossing on Highway 11 and travels up the Cline River to Pinto Lake. This route can be problematic, with difficult fords of Coral Creek and McDonald Creek.

- To experience the true wilderness qualities of the White Goat, you must access the headwaters of McDonald Creek. The easiest way appears to be from the north, taking excellent trails from Highway 93 to Nigel Pass and down the Brazeau River to Four Points Campground in Jasper (a park wilderness permit is required). From here, several routes traverse either side of Afternoon Peak. They involve fording the substantial Brazeau River and bushwacking on game trails to a 2710-metre col overlooking the middle fork of McDonald Creek. An alternate access, mentioned in *Hiking Alberta's David Thompson Country*, ascends McDonald Creek from the Cline River but this 44-km route has several difficult fords and a lot of tough bushwhacking, and is therefore not recommended.
- A truly spectacular but physically demanding access is over a high ridge east of Cline Pass. A bit of confusion may exist here because topographical maps show this rugged ridge to be Cline Pass, while the pass is actually the height of land between the Cataract Creek drainage and the creek running north into the Brazeau. Regardless, the route ascends from Highway 93 to Nigel Pass to Cataract Pass, left to Cline Pass, followed by a heart-pounding grind up to the 2700-metre ridge top. But what a view! The descent is not much easier, with steep snow slopes, huge fields of ankle-turning talus and several surprising cliff bands. This is the western fork of McDonald Creek, often called the Valley of the Lakes.



Afternoon Peak shown in the distance is an explorer's landmark at the north end of the White Goat. After an easy climb up, the crown offers views over much of the White Goat Wilderness area.



The Valley of the Lakes includes more than a dozen tarns exhibiting a dozen different colours and other distinctive characteristics. They are well worth the effort to get to them.

- A final access is not for the faint of heart. It involves a long climb from Job Lake past a series of spectacular tarns and over a high col to the east fork of McDonald Creek. The descent is somewhat steep and hazardous. The moving scree can be especially unnerving.

Once you get there it is spectacular! The western Valley of the Lakes features over a dozen lakes and tarns, some crystal clear and brilliant blue, some perpetually silted from glacial run-off, and some that remain frozen well into summer. Camping is recommended at the lowest lake, from which it is possible to spend a day exploring the upper lakes. Mountain goats frequent the valley's cliff bands and the whole area is dominated by rugged Mount Stewart. In the heart of the valley is a massive cairn, made with skill and care, of a rock finger pointing to Mount Stewart. Who made it is a mystery. An adjoining valley to the south contains McDonald Lake, which has a trail meeting it, apparently arising from McDonald Creek valley. The Valley of the Lakes appears to be "grizzly central," judging by the amount of bear scat in the area.

The middle fork of McDonald Creek is an extensive willow meadow deeply incised by tributaries of the main creek and is home to moose, grizzly and large herds of bighorn sheep. On snow patches on the slopes of Afternoon Peak, rare mountain caribou may still be spotted. Camping is difficult, with barely a flat spot to be found among the willow tangles.

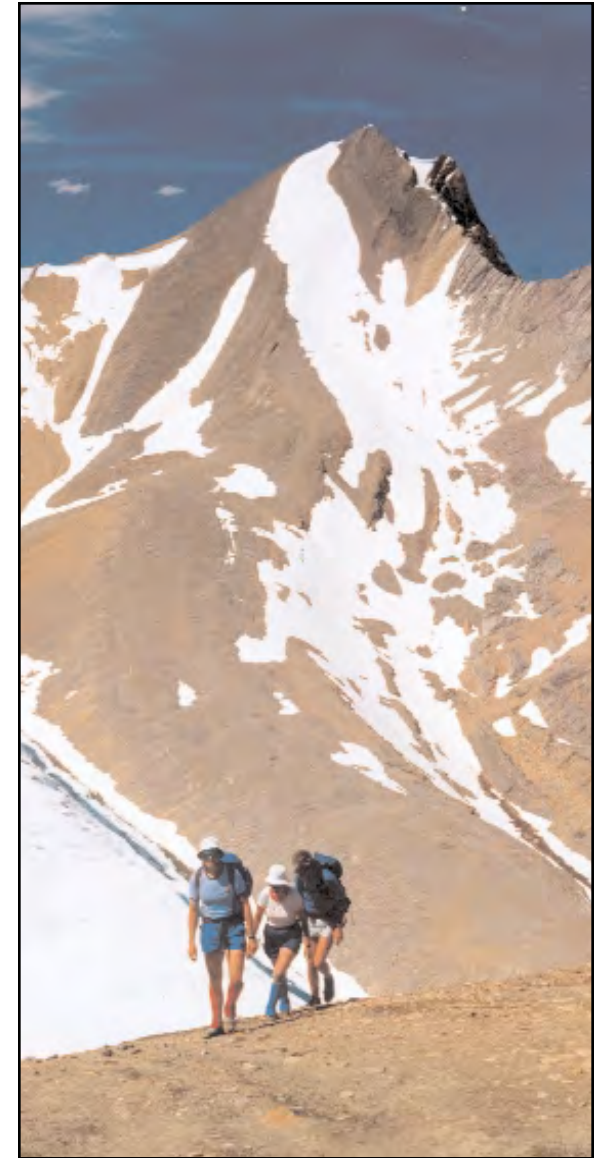
The eastern fork is gentler. Near treeline is an old outfitter's camp, which makes an excellent base from which to explore. For the energetic, a route up the creek past waterfalls and two frozen alpine tarns takes you to the 3162-metre summit of

Mount McDonald. Views of the Columbia Icefield expanse and of peaks north in Jasper and south in White Goat are spectacular.

Although this area has been off-limits to horses, hunting, fishing and trapping, signs of these remain, including an old cabin at the fork of McDonald Creek. Trapper Michael Cline of the Hudson's Bay Company may have built it. Some of the trails appear to have been forged by horse traffic and are now kept open by wildlife. There is the odd old outfitter camp with its characteristic midden of rusted bean cans and whisky bottles.

Historically the Kootenay, Peigan and Stoney Nations have visited this area. Later visitors included James Carnegie in 1859, the Earl of Southesk in 1892, geology professor A. P. Coleman in 1902 and the adventurous Mary Schäffer at the beginning of the twentieth century.

In order to maintain the White Goat as the wilderness jewel it is, visitors are encouraged to follow no-trace wilderness travel guidelines, camping away from water bodies, properly disposing of human waste, using backpacking stoves and packing out garbage. As in adjoining national parks, nothing can legally be taken from the White Goat except photographs and fond memories.



Mt. McDonald on the Bighorn's northwestern boundary dominates and defines the northern boundary of the White Goat.

GEOLOGY & EXPLORATION



12

ROGER MACQUEEN, PH.D.

GEOLOGY & EXPLORATION



Earth scientists know much about the geology of the Bighorn Wildland region from more than a hundred years of geological mapping and more recently, from seismic studies and from drilling for oil and natural gas in the foothills.*

It's the geology of the Bighorn Wildland that is responsible for the magnificent scenery of today.

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Figure 1. Rocky Mountain Front Ranges. View north in Longview Lakes area, northwest Bighorn Wildland. West-dipping and resistant-weathering gray Upper Paleozoic carbonates from right to centre of photo, overlain by less resistant-weathering brown and orange Mesozoic rocks in left of photo. Note the well-developed dip slopes, which are inclined bedding planes exposed by erosion.

Readers can learn more about the geology of Alberta, including that of the Bighorn Wildland, in a fine general reference written for non-specialists entitled *A traveller's guide to geological wonders in Alberta* (Mussieux and Nelson, 1998).

* References and terms in blue text are defined briefly in a glossary at the end of the book.

GEOLOGY

The Canadian Rocky Mountains and Foothills are the crumpled western edge of the [Western Canada Sedimentary Basin](#) that underlies the prairies. They are also part, however, of something much bigger – the huge North American [Cordilleran Mountain Belt](#) extending from the northern Yukon to Mexico and making up North America's deformed western edge.

The Rockies, and the undisturbed sedimentary basin to the east, are mostly layered sedimentary rocks forming two quite different thicknesses of rock called “sedimentary wedges.” The older of the two, the [platform wedge](#), overlies [igneous](#) and [metamorphic rocks](#) continuous with the exposed [Canadian Shield](#) to the northeast. Platform wedge rocks are mainly [carbonate rocks](#) – that is, limestones and dolomites – with some [shales](#) (Fig. 1), which were deposited in shallow basins on and beside the ancient continent. We don't see the complete platform wedge in one place, but reconstructions suggest that it was more than three km thick when deposited. Platform wedge rocks range in age from Proterozoic time approximately one billion years ago to mid-Mesozoic time approximately 150 million years ago (Fig. 2). During this long time period, there was very little mountain-building in the region.

The younger, overlying wedge is the [clastic wedge](#), made up of [sandstone](#), [siltstone](#) and shale eroded from the rising mountain ranges to the west. These mountains resulted from compressive [plate tectonic](#) interactions in which tectonic plates of the Pacific Ocean were squeezed against the North American plate from mid-Mesozoic time about 170 million years ago until about 55 million years ago. Again, we don't see the complete clastic wedge

anywhere, but likely it was more than five km thick when deposited. Both wedges have many formations: nearly 40 different formations are found in the Bighorn Wildland. Their study is important in understanding the origin of these rocks and any resources that they may contain. Mussieux and Nelson (1998) provide additional information on the geology and origin of the Rockies.

Figures 3 and 4 show the Rocky Mountain structure in the Bighorn Wildland region. Figure 3, a generalized geological map, shows major rock units and structures including faults and folds. Most Bighorn Wildland faults are thrust faults, or thrusts – faults that may be slightly inclined to steeply inclined at the earth's surface, but commonly flatten below the surface; above the fault rocks have been moved – pushed, really – some great distances compared to rocks below the fault. Thrust faults in the Rocky Mountains are mainly responsible for what geologists call crustal shortening. Through the effects of thrust faulting and folding, rock masses perhaps 100 km in width when deposited have been shortened to widths of only 50 or 60 km. Figure 4 shows two geological cross-sections in and close to the Bighorn Wildland: in these sections thrust faults caused overlapping of rock units, normally older rocks resting on younger rocks with a thrust fault between the two. The westernmost part of the Bighorn Wildland has normal faults, where rocks on one side of the fault plane have dropped compared to rocks on the other side. Thrust faults produce compression, a kind of telescoping of rocks, but normal faults produce extension of rocks – units with normal faults may be wider or longer in area than before faulting. Rocks can also be bent to form folds of two different kinds: anticlines (Fig. 5) and synclines.

Most of the Bighorn Wildland (Figs. 3 and 4) is in the Front Ranges geological province of the Rocky Mountains, except for the Blackstone-Wapiabi area to the northeast and Panther Corners to the southeast, both of which are part of the Foothills geological province. The westernmost part of the Bighorn Wildland, west of Abraham Lake toward Saskatchewan Crossing, takes in a small part of the Main Ranges geological province.

The Foothills province extends east as far as Cordilleran folding and faulting is found (Fig. 3). Bighorn Wildland Foothills are part of the Central Alberta Foothills, the area between the Bow and Athabasca Rivers. The geology of the Central Alberta Foothills is controlled by two major west-dipping thrusts, the Brazeau thrust and the Bighorn-Cripple Creek thrust, both several hundred kilometres in length and with displacements of up to 30 km. This means that the rocks above the thrust fault have moved about 30 km to the east of where they once were (Figs. 3 and 4)!

The Front Ranges province has a series of thrust-faulted slices, mostly dipping to the west. These thrust slices expose platform wedge gray-weathering Middle and Upper Paleozoic (Fig. 2) carbonate rocks and in the upper parts, Mesozoic rocks of the clastic wedge. These Mesozoic rocks are soft and prone to weathering and erosion, so they are usually found in the valleys of the Bighorn Wildland (Fig. 6).

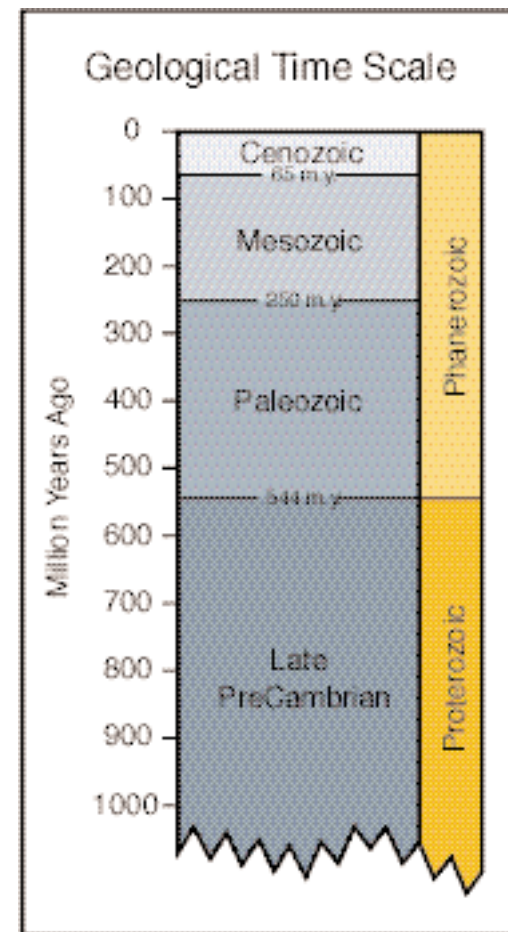


Figure 2. Simplified geological time scale. The Phanerozoic Eon is divided into the Cenozoic Era, Mesozoic Era and Paleozoic Era. Precambrian time is divided into the Proterozoic Eon and the Archean Eon (not shown, as there are no known Archean rocks in the Bighorn Wildland). Ages given in years were derived from radiometric dating.

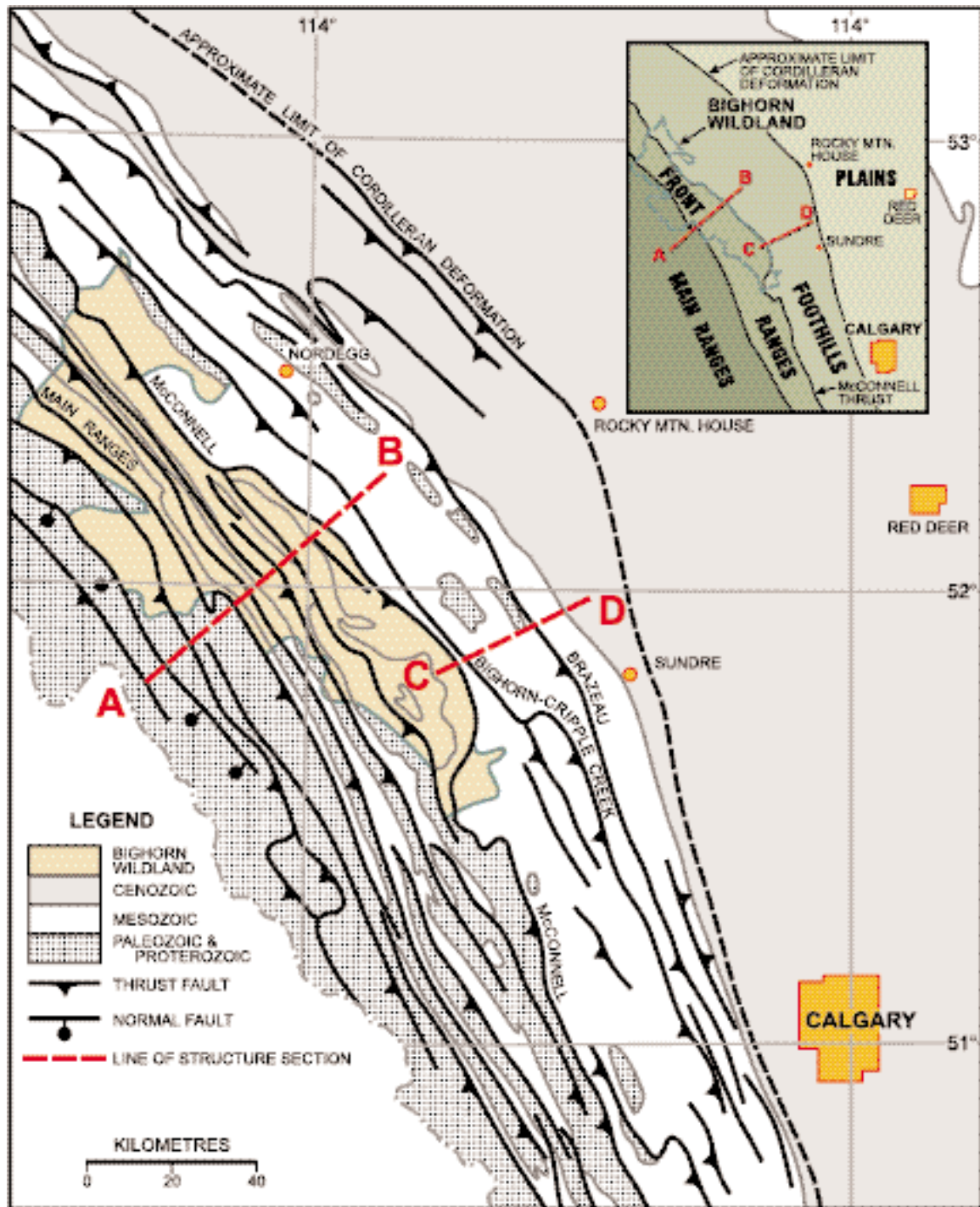


Figure 3. Geological sketch map showing (a) major groups of rock units in the Central Foothills of Alberta; (b) major thrust faults, some named (from east to west: Brazeau Thrust, Bighorn-Cripple Creek Thrust; McConnell Thrust; Sulphur Mountain Thrust; Bourgeau-Siffleur Thrust and Pipestone Pass Thrust [Main Ranges Thrust]); arrows on the thrust faults point toward the direction from which the thrust masses came; (c) normal faults in Main Ranges, west side of sketch; filled circles indicate down sides of faults; (d) locations of geological cross-sections A-B and C-D, shown in Figure 4; (e) approximate edge of Cordilleran deformation marking the eastern boundary of the Foothills (from Hamilton et al. 1999); (f) approximate area of Bighorn Wildland shown in green; (g) city of Calgary, and towns of Nordegg, Rocky Mountain House and Sundre. Modified from Figure 1, in Jones and Workum (1978, p. 2). Used with permission.

Figure 4. Geological cross-sections A-B and C-D, locations shown on Figure 3. These cross-sections are vertical slices into the earth, showing explanations of the structure of the rocks from the surface to depths of 5 to 7 1/2 km below sea level. Geological sections such as these are constructed from surface geology as seen in the geological sketch map, Figure 2; information from well logs, cuttings and cores from petroleum exploration wells (one well is shown and named on cross-section A-B and five wells are shown and named on cross-section C-D); and seismic sections from geophysical studies completed to discover structure

below the surface, along lines on the surface.

On these cross-sections you can see the following:

- 1) The boundaries of the Foothills, Front Ranges and Main Ranges, shown across the top of cross-section A-B.*
- 2) Precambrian basement, the igneous and metamorphic rocks of the Canadian Shield, underlies the sedimentary rocks of the Rocky Mountains and is not involved in thrust faulting or folding.*
- 3) The thrust faults shown in sections A-B and C-D flatten below the surface, joining to form a **master fault** above the basement.*
- 4) Many of the thrust faults are folded.*

5) Exploration wells in both sections are located in the Foothills and were drilled where anticlinal folds are present; most commercial Foothills hydrocarbon traps are found in anticlinal structures of the kind shown here.

6) The vertical and horizontal scales are the same, providing a realistic view of the geological structure below the surface.

Modified from cross-sections C-C' and D-D' shown in Jones and Workum (1978, p.17).

Used with permission.

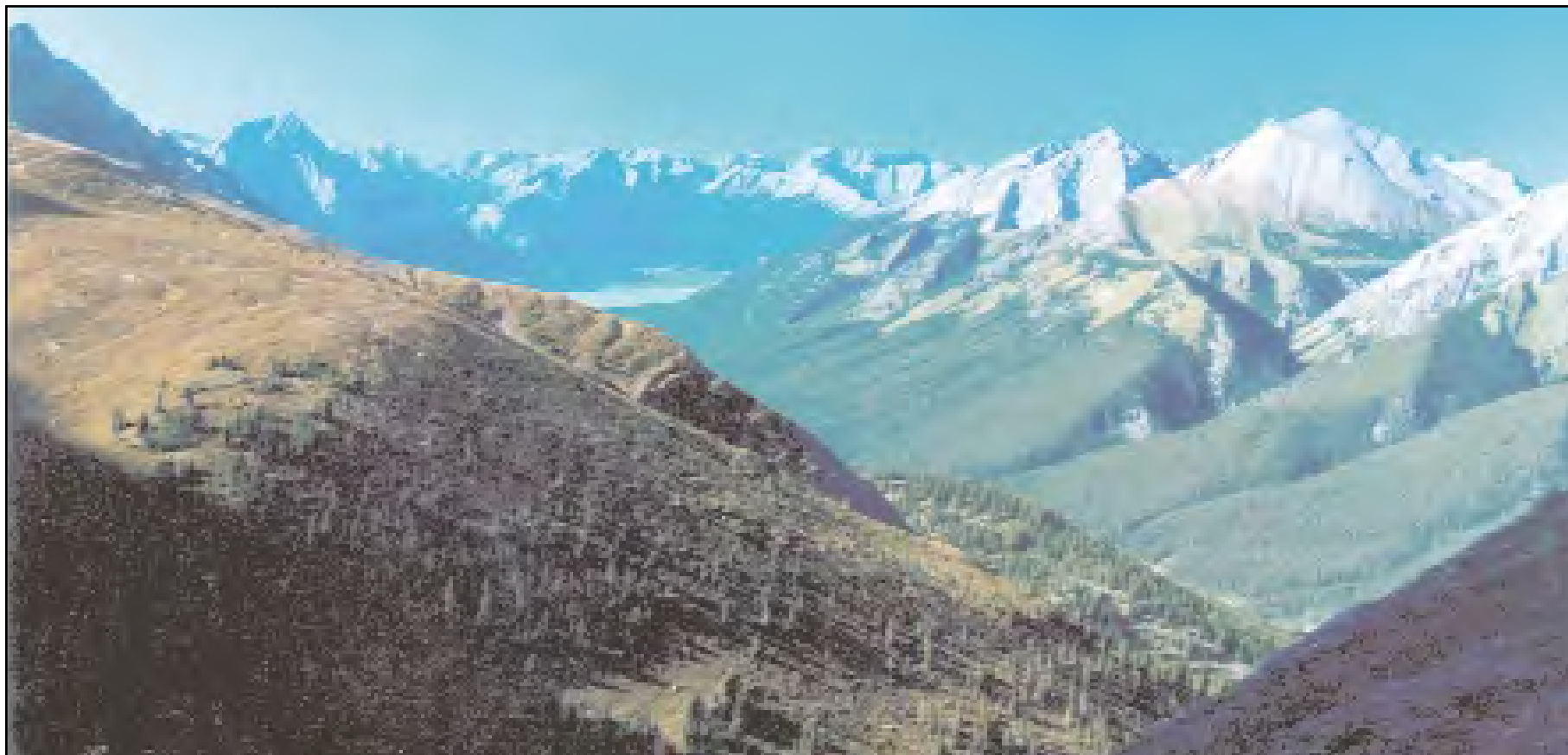


Figure 5. View north from an airplane toward an anticlinal fold in Brazeau Range, Rocky Mountain Foothills east of the Bighorn Wildland. David Thompson Highway is seen at the top of the photo to the left. Rocks seen are Upper Paleozoic carbonates in the core of the Range. Note that the bedding in the west limb (side) of the anticline (left of photo) dips gently to the west, but the bedding in the right limb of the anticline (right of photo) is vertical. Geologists call this an “east-facing” fold, showing thrusting from the west.

The eastern boundary of the Front Ranges province – which is also the western boundary of the Foothills province – is the McConnell Thrust fault, named after R. G. McConnell of the Geological Survey of Canada (G.S.C.), who first identified and recognized the importance of this fault (Figs. 3 and 7) in 1887. This thrust fault is the surface over and along which Lower Paleozoic to Lower Mesozoic rocks of the platform wedge were displaced from the west to where they are now, directly above Upper Mesozoic rocks of the clastic wedge. The western boundary of the Front Ranges Province is a thrust fault, the Main Range Thrust (Figs. 3 and 4), which brings very hard, resistant Lower Paleozoic and Proterozoic rocks of the platform wedge to the surface.

In the Main Ranges province we have resistant Lower Paleozoic/Proterozoic (Fig. 2) rocks in broad, open folds underlain by nearly flat-lying thrust faults. Weathered mountain faces here are steep and high (Fig. 8).

Geological mapping in the Alberta foothills goes back to the nineteenth century. Foothills geology is hard to understand by looking only at rocks on the surface because much of the rock has been eroded over time, or else it is covered by soil, glacial material or vegetation, thus hiding much of the structure. The early geological mapping was excellent for its day, but the geology of the foothills can't be well understood without the third dimensional information that we have acquired more recently from seismic work and oil and gas drilling. Recent work shows that most thrust faults of the Foothills province are themselves folded (see Fig. 4), once considered rare. To make things even more interesting, recent work also proves that some thrust faults don't reach the surface – they are blind thrust faults that can only be seen on seismic



sections or analyzed from petroleum well data (e.g., Jones 1988). This is important because it helps us to understand **structural traps**, reservoirs and seals that may contain fossil fuels.

Early geological exploration by A. R. C. Selwyn, G. M. Dawson and D. B. Dowling, all famous nineteenth- or twentieth-century G.S.C. geologists, was conducted mainly to help in the search for coal (references in Smith 1989). Early work was completed on foot and using horse parties, a style of fieldwork that lasted until the 1950s. As coal exploration became less important from the 1920s onward, exploration for oil and natural gas became an important reason

for geological mapping of a number of 1:50000 topographic sheets in the region by G.S.C. geologists in the 1930s and 1940s. The last 30 years have seen new geological mapping in the Front Ranges and Foothills provinces that blends surface and subsurface information, leading to better understanding of geological structure and possible oil and gas traps.

Figure 6. Rocky Mountain Front Ranges, view north along Whiterabbit Creek to distant Abraham Lake. Resistant-weathering gray peaks to the right are west-dipping Upper Paleozoic carbonate rocks, overlain by recessive-weathering Lower Mesozoic rocks, mostly tree-covered and occupying Whiterabbit Creek valley.



Figure 7. Ridge in Foothills, Panther Corners, southernmost Bighorn Wildland. View northwest across Red Deer River valley to Scalp Creek area showing Rocky Mountain Front Ranges in the distance above the McConnell Thrust.

RESOURCES

Early geological work showed that about half of Canada's bituminous coal is found in Upper Mesozoic clastic wedge rocks of the Rocky Mountain Front Ranges between Crowsnest Pass, British Columbia and the Panther River-Clearwater District (Smith 1989). Coal is also found in the Bighorn Basin of Foothills Belt, mostly east of the Bighorn Wildland. The Nordegg area of the Bighorn Basin was an important source of coal for the railways from World War I until closure in 1955 owing to reduced demand from the railways. Some coal seams occur in the Bighorn Wildland, a few of which have been well explored, and some reclamation of the disturbance from coal exploration has taken place (Fig. 9). As part of the Eastern Slopes Resource Management Policy, the Alberta government has not permitted coal exploration in the Bighorn Wildland since implementation of the Coal Policy of 1976.

Natural gas is found in foothills anticlinal and fault-bounded structural traps. The Front Ranges are unfavourable structurally for petroleum exploration and they fall mostly within national parks or provincial reserves. Other than the Turner Valley oil field, foothills pools only produce natural gas. Present or past producing gas fields in the vicinity of the Bighorn Wildland include Panther River, Limestone Mountain, Nordegg and others. G.S.C. scientists suggest that the foothills of Alberta, British Columbia, and the Yukon have about 14 per cent of the discovered natural gas reserves of the Western Canada Sedimentary Basin, but that there could be more to be discovered. Bighorn Wildland foothills have two areas of interest to industry: Panther Corners and Blackstone-Wapiabi. Because of the sensitivity of terrain in these areas, the Alberta Wilderness Association position is that further drilling should not occur.

The discovery of what is now the Ekati diamond mine in the Northwest Territories sparked a huge staking rush in Canada that included Alberta, where more than 40 kimberlite occurrences are known, some of which contain diamonds. None are known in the Bighorn region however, and it's not very likely that we'll find diamonds there. Other interesting minerals that geologists look for in sedimentary rocks are lead and zinc, and gold and silver – these are not likely to be found in the Bighorn Wildland either. Sand and gravel of glacial and river origin are found in the Bighorn Wildland but the only reason to produce this material would be for local road or building construction.



Figure 8. Rocky Mountain Main Ranges, Ram Glacier area, headwaters of Ram River, west-central Bighorn Wildland, showing Lower Paleozoic nearly flat-lying (i.e., nearly horizontal bedding planes) resistant-weathering carbonate rocks. Note steep faces and castellated peaks, typical of Main Ranges carbonates as also seen on Castle Mountain and above Lake Louise in the Bow River Valley.



Figure 9. Foothills of Panther Corners area, southernmost Bighorn Wildland. Upper Mesozoic, soft-weathering brown and orange sandstones and shales in foreground; view west to gray Upper Paleozoic rocks of the Front Ranges above the McConnell Thrust. Note reclaimed former coal exploration road on Mesozoic rocks in foreground.



Figure 10. Rocky Mountain Front Ranges. Magnificent local scenery showing cirque and tarn (cirque lake) developed in Paleozoic carbonate rocks, Lost Guide Canyon trail area, Clearwater River, south-central Bighorn Wildland.

BIGHORN WILDLAND SCENERY AND HERITAGE

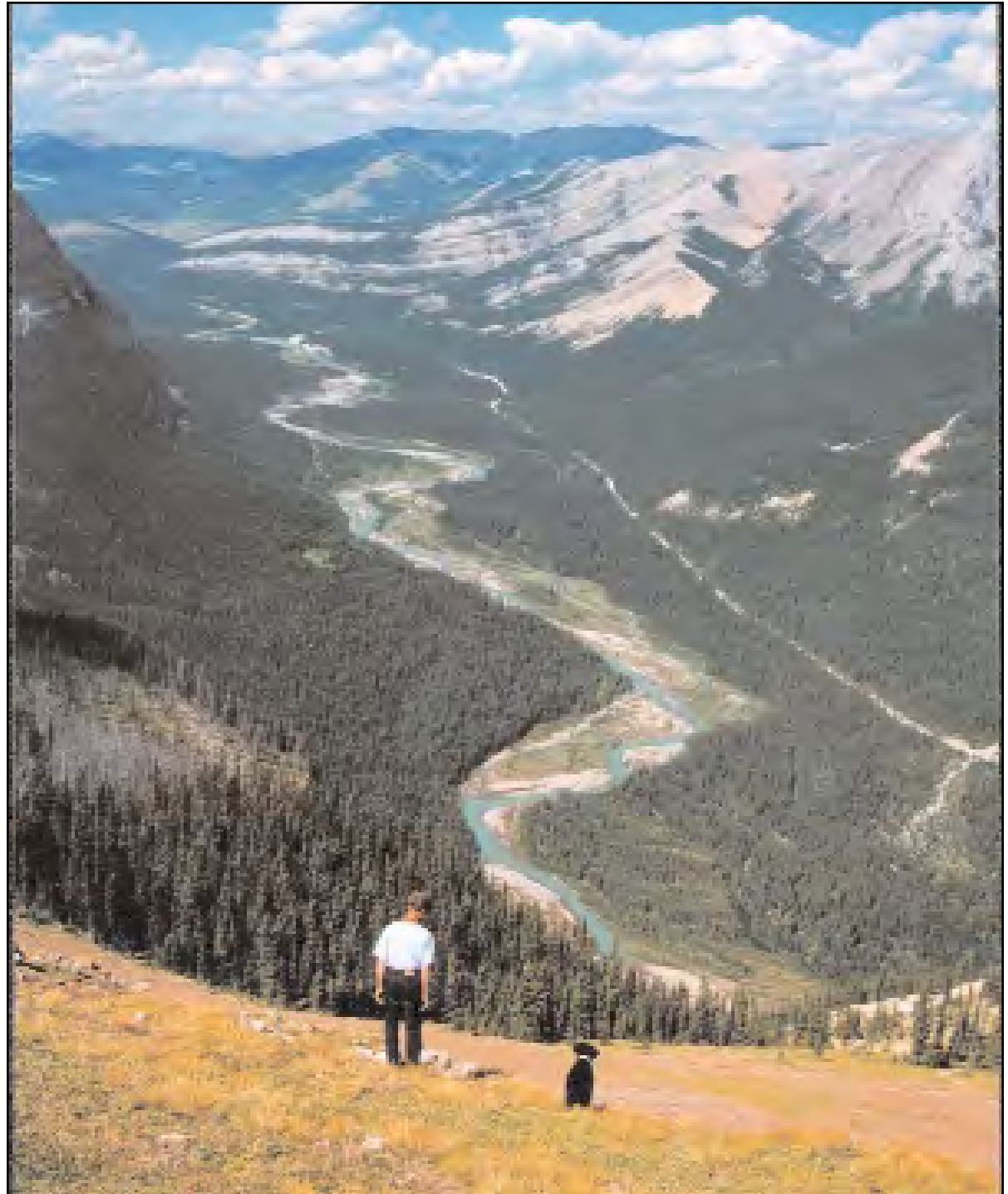
In the Bighorn Wildland the lush valleys and well-treed ridges of the foothills change westward into the broad valleys and jagged, majestic peaks of the Front Ranges. How was this landscape created? The underlying geology is the major cause, but two more factors are important. The first is that the Rocky Mountains and foothills seem to have been strongly uplifted over the past few million years (when compared to most of the approximately 55 million years since [mountain building](#) ended in this area), and this recent uplift greatly increased erosion, allowing new, high-relief topography to develop. It is this high-relief topography that was glaciated during the past two million years. The second factor is that the Rocky Mountains have only recently been freed from the alpine and valley glaciers of the Cordilleran ice sheet of the past two million years.

Because the Rocky Mountain landscape became mostly free of ice in the last few thousand years (present glaciers such as those of the Columbia Icefield are remnants of the most recent ice age), most of today's features are part of a glacially sculptured high-relief topography. This is what gives us the great scenery: uplifted rocks that weather differently (some soft, some hard), high-relief topography and glacial sculpturing! Fortunately, the period of erosion since the ice departed has not been long enough to destroy the superb glacial effects we see now, especially in the high country. These include arêtes (sharp-edged ridges), horns (sharp-pointed triangular peaks), cirques (head-of-valley armchair-shaped hollows), tarns (cirque lakes) (Fig. 10), U-shaped valleys (Fig. 11), hanging valleys, rock basins and rock glaciers.

Glacial deposits, including sand, gravel and glacial till, are also present. Truly modern features are rare in comparison with glacial features because the landscape is so young geologically; they include outwash plains of the present rivers and minor features such as landslides.

In *Eastern Slopes wildlands – Our living heritage*, Kolar and Brawn (1986) and other authors discuss a number of Alberta wildland settings, and present a strong plea for the preservation of Alberta's unique wildland heritage. The Bighorn Wildland has an important geological heritage too, from evidence of the broad sweep of geological time to the progress we humans have made in understanding and appreciating the geological origin and importance of this grand area. I hope that what is briefly sketched here helps readers enjoy the Bighorn, perhaps with a new and humbling sense of the majesty of its origin and of the importance of preserving this magic area for future generations.

Figure 11. View from Rocky Mountain Foothills west toward Rocky Mountain Front Ranges, looking upstream along Red Deer River toward Ya Ha Tinda Ranch from a high ridge, east side of Panther Corners. Note U-shaped valley; modern meander belt of Red Deer River, which meanders over a glacial outwash plain; and road cut on north (right) side of river.



PLANTS OF THE BIGHORN



13

ELAINE GORDON

PLANTS OF THE BIGHORN



The highly varied plant life of the Bighorn Wildland is related to the diversity of the five different natural subregions, including the Alpine, Subalpine, Upper and Lower Foothills and Montane.*

Each subregion offers a wealth of plant treasures for wildflower enthusiasts.



White forget-me-not (Myosotis alpestris) are an uncommon and beautiful variant of the normal blue-coloured flower.

** The Natural Regions Map of the Bighorn can be found on page 13.*

PLANTS OF THE BIGHORN

Much of the Bighorn is made up of long, open upper foothills ridges that rise in elevation toward the peaks of the Front Ranges to the west. These are ideal habitat for wildflowers, particularly during prime blooming season from approximately early July to mid-August. Some years provide better displays than others, but these ridges can usually be relied upon to burst into a cycle of colours as different species bloom through the short five- to six-week flowering period. When the monkshood and larkspur are flowering in August, slopes that are normally gray-brown can be blue as far as the eye can see.

This unique area contains several rare or uncommon plant species, and care must be taken to protect them and their habitats. Therefore, when visiting these areas, please stay on established trails and do not collect any plants or pick any flowers. But do enjoy them all and take home as many photos of these beautiful plants as you like.

ALPINE

The Alpine subregion refers to the high altitude area that is too cold and windy to support trees. This is not an area for the fainthearted of any species! Winter starts early and ends late. During their active growing season, the resilient little plants that grow here are exposed to daily summer temperature fluctuations, ranging from blistering hot sun in the daytime to freezing cold at night. They are constantly battered by wind and precipitation, usually in the form of snow. Dwarf shrubs such as the white mountain dryads and sturdy little arctic and reticulated willows dominate most of the area, spreading in dense low-growing mats hugging the windswept ground. Any form of shelter, whether a rock, a crevice or an east-facing slope, provides a

home for plants such as mountain heathers, moss campion, woolly everlasting, creeping beardtongue and purple saxifrage. Rock cress, double bladderwort, alpine wallflower and nodding pink cling tenaciously to dry slopes and ridges, and even to steep talus slopes. How do they do it?

Surprisingly, it is often the snowfall itself that provides not only shelter in the form of insulation, but also nourishment from meltwater dissolving essential minerals in the rocks. The constant freeze-thaw process of water opens cracks and breaks rocks into smaller pieces, which plants may then use to their advantage. Both high altitude and high latitude plants are almost always perennials with small leathery or hairy leaves that keep them from drying out. Small creeping or tufted growth forms also help to avoid desiccation and allow plants to absorb heat from adjacent rocks. In these ways, the plants of these extreme environments work with the limited resources available to them to survive where little else can.

Alpine poppies startle people who unexpectedly come on these exotic little plants at the highest elevation where things still grow in the mountains, up around 2800 metres. They can be found in rare spots along the Front Ranges, on high ridges in the Forbidden Creek drainage and on the high passes at the top of the Littlehorn and Bighorn Rivers. Another unusual and strikingly beautiful plant found in rare places in the Bighorn is nodding arnica. It covets sheltered nooks well above treeline, but not up at the top of the world where the poppies blow. This plant occurs as a clump about 15 cm tall, with a profusion of nodding yellow flowers on reddish stems. Slightly more common in the Bighorn's Alpine subregion, and a wonderful find when in bloom, is one of the talus-slope lovers, the alpine wallflower.

KRUMMHOLZ COLONIES

The German word *krumholz* means “crooked wood” or “elfin wood.” This term is perfectly descriptive of the stunted forests that occur in the Canadian Rockies at the extreme edge of the treeline. These delightful little forests spark the imagination and inspire the spirit. It is easy to think of their tangled branches as inhabited by elves. In the Canadian context these could be quizzical chipmunks or golden-mantled ground squirrels. It is not unusual to find either of these creatures standing on hind legs, hands neatly folded in front, apparently lecturing on life in the high country from a *krumholz* pulpit.

Flat-needled and smooth-barked subalpine fir and square-needled, rough-barked Englemann spruce are the most common species to form *krumholz* in the Bighorn Wildland. In the severe habitat they occupy, *krumholz* species are true tree species, stunted and sheered off by blasting winds. They cannot grow higher than the snowdrifts that protect them during the height of winter storms.



These broken remnants of the fir-spruce forest at treeline on a high ridge in the South Ram are typical of krumholz throughout the Bighorn.



*The hardy and uncommon alpine poppy (*Papaver kluanensis*) endures the rigors of exposed sites in the alpine around the 2800-metre level. It occurs in scattered sites throughout the Bighorn.*



Pallas' wallflower (Erysimum pallasii), although fairly common in the arctic, is relatively rare in the alpine of the Rockies. The individual flowers are actually quite big (approximately one cm in diameter). The plants are biennial or short-lived perennial spreading two years in the rosette stage and quickly flowering and dying. They prefer calcareous soil and lots of nitrogen, so they are found near dung and in alpine rock piles.

SUBALPINE

The lower altitude of the high Subalpine subregion still is subject to high winds and precipitation, but the temperature is somewhat warmer than that of the Alpine. In the upper subalpine altitudes, scrawny limber pines, Engelmann spruce and subalpine fir are dwarfed and misshapen by the wind into unique forms known as krummholtz. Krummholtz trees and shrubs are characterized by a lack of branches on their windward side, and their distorted asymmetry is symbolic of the wildness of this special area, making them favourites among painters and photographers.

This is an area where, in summer, meadows of wildflowers bloom in breathtaking masses of colours, a just reward for the arduous hikes that wildflower lovers must undertake. Here species of paintbrush, golden fleabane, alpine forget-me-not, rock cress, bluebell, sweetvetch (which the bears love), rock jasmine, mountain sagewort and other alpine species grow intermingled with low woody shrubs such as bearberry, purple mountain heather and the beautiful Lapland rosebay.

Displays of paintbrush in subalpine habitats within the Bighorn are as highly varied in colour as can be found anywhere. These plants are hemiparasites on the roots of various grasses and trees, and they readily hybridize, making them a nightmare to identify. But their hybridization also brings out an array of colours more variable than any other Bighorn wildflower variety. From yellows to deep magenta, pink and orange and every variation in between, the paintbrushes are a riot of colour.

The strikingly beautiful Lapland rosebay, a member of the rhododendron family, flowers so early that few have had the privilege of seeing it in bloom. This most gorgeous of subalpine species occurs in pockets throughout the Bighorn and to some extent in nearby parts of Banff Park. After finding the plant once or twice, enthusiasts develop an eye for its typical treeline location, usually on open but slightly sheltered slopes. Lapland rosebay is found on slopes above Pinto Lake, in parts of the South Ram drainage, in the headwaters of the Bighorn River, on the slopes of Job Creek tributaries and along the Front Ranges above the Wapiabi River.

Icy-clear crystal mountain streams tumbling down from the ramparts and seepages above form pools, streams and wet areas where mountain sorrel, bracted lousewort, leafy asters and alpine buttercups vie for space with other moisture-loving species.

At lower subalpine altitudes, juniper shrubs and coniferous trees such as Engelmann spruce, larch and subalpine fir begin to dominate, providing shelter for the more shade-tolerant plants. Here one can look for the wintergreens (belonging to the genus *Pyrola*), bunchberry, twinflower and heart-leaved arnica, all of which extend well into the Montane. With luck, alpine harebells might be spotted on the craggy cliffs and open talus slopes, while yellow columbines may be seen in open woods and rocky slopes among the conifers, alders and willows. On calcareous cliffs and ledges it takes a good eye and determination to detect scented everlasting and smooth cliff brake.



Indian paintbrush (Castilleja miniata). This showy flower often puts on displays of colour on well-drained southerly slopes during summer.



Franklin's lady's slipper (Cypripedium passerinum). This fragrant little orchid has been eliminated from many accessible areas by flower picking but can still be found in secluded foothills pockets throughout the Bighorn.



Bladder campion (Melandrium attenuatum), looking like tiny lanterns, are an unexpected delight in otherwise bleak alpine locations.

UPPER AND LOWER FOOTHILLS

As the Subalpine gives way to the Foothills ecoregion, the warmer air and gentle diversity of the landscape provides a unique area where species intermingle. This area along the eastern face of the Rocky Mountains contains important watersheds fed by the clear mountain springs and streams from the high ramparts. Here beautiful forests of spruce, balsam fir and pine provide a canopy for many common shrubs, together with showy aster, wild lily of the valley, sweet bedstraw and sedges. In drier areas, lodgepole pine forests provide a canopy for an understory of common reindeer lichens. Wetter areas are home to both paper birch and bog birch. In aspen and balsam poplar forests many common shrub species are found. Here too is a good place to keep an eye out for orchids. Colourful calypso orchids and lady's slippers prefer moist woods, while in wetter areas several bog orchids are common. Northern twayblade, found in this region, extends its range all the way to the Subalpine.

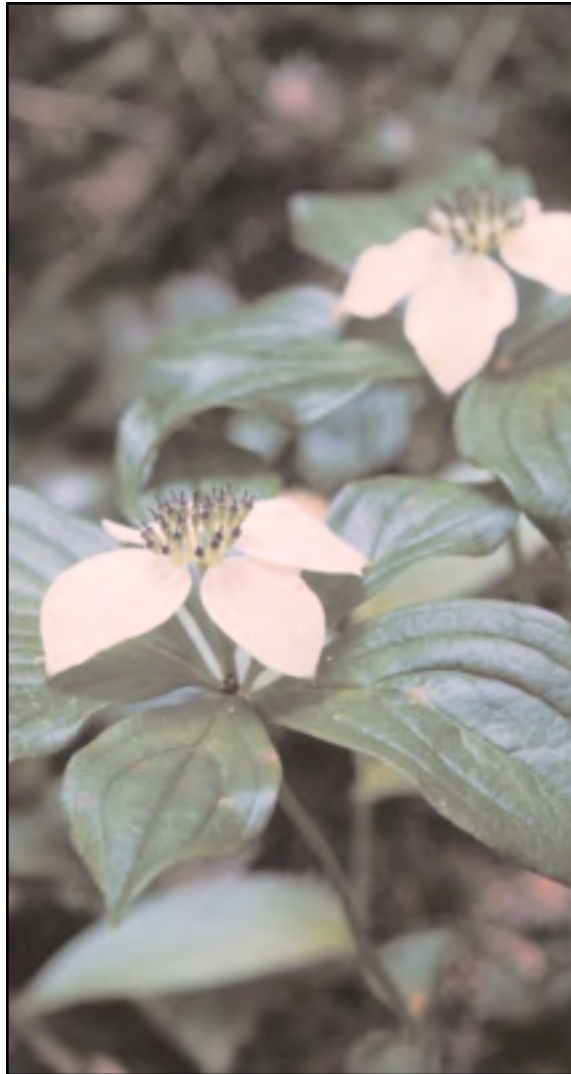
The rolling landscape of the Lower Foothills supports plant communities generally dominated by aspen and balsam poplars that form a canopy over alders, chokecherry, willows and wolf willows. Northern reed grass, tufted hair grass, hairy wild rye and rough fescue are abundant grasses throughout this region and provide an important source of nutrition for migrating ungulates. In wetlands, mare's tail and the beautiful buckbean are often found with numerous species of sedges. Early in spring, just as the snow is melting, glacier lilies may be found on grassy slopes and in open forests up to the timberline.

MONTANE

The Montane ecoregion was never common in Alberta and it is becoming steadily less common as it is converted to human use. Small in area, its ecological contribution is large because the Montane is key winter range for much of Alberta's wildlife. The Montane is often, but not necessarily, associated with river flats and occurs as open subalpine grasslands and grasslands with a canopy of sheltering savanna-like trees including aspen, pine and sometimes Douglas fir. The Bow River valley near Banff and Canmore townsites is a good representative of Alberta's Montane ecoregion, and a good example of how it is rapidly lost to urban development.

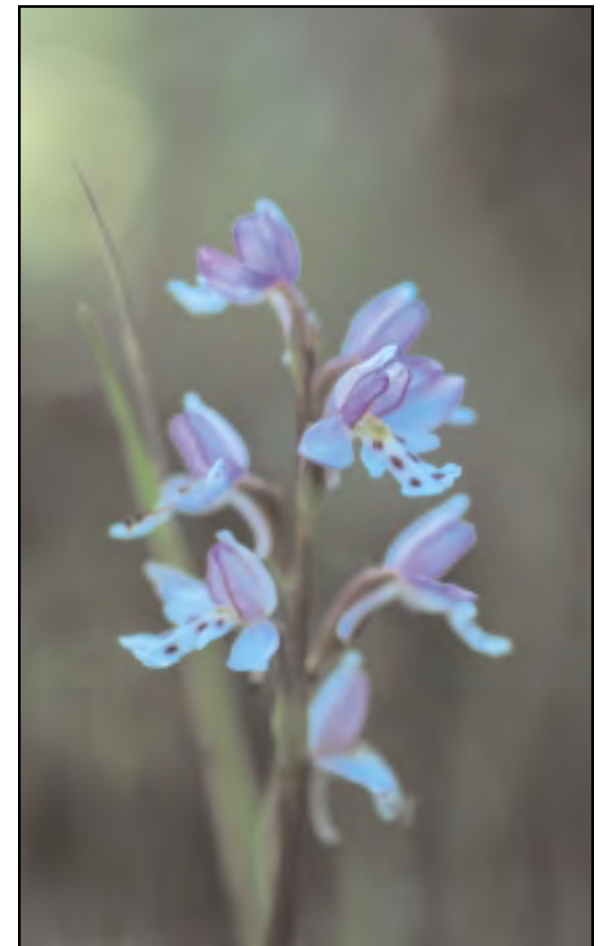
The Bighorn lost its most significant Montane to human development when much of the Kootenay Plains was flooded for power generation behind the Bighorn Dam on the North Saskatchewan River. Smaller examples of this important ecoregion remain intact at Panther Corners, at Ya Ha Tinda Ranch and in pockets along the Clearwater River, all within the Bighorn Wildland. These are essential winter habitats for park and Bighorn wildlife. The open grasslands associated with the Montane, or occurring at elevations just above the Montane, are sometimes referred to as subalpine grasslands.

Grassy valleys and grassy slopes throughout the Bighorn Wildland support rough fescue, California oat grass and June grass, interspersed with wild blue flax, pasture sagewort, Mackenzie's hedsarum and several species of sedges. These grasslands are integral to the survival of all ungulate species on their migrations to both their winter and summer ranges.



Bunchberry (Cornus canadensis), above. The flowers of this miniature dogwood are followed by clusters of bright red berries which decorate the woodlands later in the summer and fall.

Round-leaved orchid (Orchis rotundifolia), below. Fairly common in damp woods and wet calcareous bogs fed by mineral springs where its flowers can be seen from mid-July on.





Crusty rock lichens grow about an inch every 100 years.



Mossy streams are frequent in the old-growth forests and mountain seeps of the Bighorn.

OTHER LIFE FORMS

Lichens are actually two organisms in one. They are made up of a fungus and an alga; each contributes to the survival of the other. Although lichens are not plants, they are usually included in plant species lists. Lichens are found in all the regions within the Bighorn, from the rock lichens in the Alpine to reindeer lichens in the Montane. They are common on the forest floor, on the bark of both coniferous and deciduous trees and on shrubs, and are often seen hanging like old beards from tree branches. After a rain, mossy forest floors spring to life with leafy *Peltigera* and miniature forests of red-capped *Cladonia* lichens. Broad patches of silver *Stereocaulon* lichen are suddenly alive and the tree lichens take on rich new colours. Lichens are important in their own right and provide a food source for many ungulates. Their presence indicates a healthy ecosystem.

In the wake of a perfect combination of August rains and a few warm days, fungal flora, or wild mushrooms, can convert the Bighorn's forest floors into amazing displays of rich colour and form. From purple *Cortinarius* to bright orange coral fungi and delicate ear cups, brilliant red-capped *Boletus*, and the shingle-topped hedgehogs, the Bighorn is well endowed with fungal variety. The area can also provide a treat for real connoisseurs most years in late August–early September. This is when, in the right place and at the right time, the pine mushroom, or the coveted Japanese matsutake, arises in the Bighorn, often in prolific fairy rings. In Alberta, and especially in secret spots in the Bighorn, these softball-shaped, very solid mushrooms with their characteristic cinnamon bouquet appear on dry pine slopes just around treeline.

There are many important plant species, including mosses, that have not been referred to here simply because there are far too many to include. However, those mentioned will give a visitor a sample of the diversity of this important area and hopefully instil a sense of gratitude for the singular richness of the flora of this region.



In the late summer a profuse variety of mushrooms and other fungi can be found throughout the woodlands of the Bighorn.

WILDLIFE OF THE BIGHORN



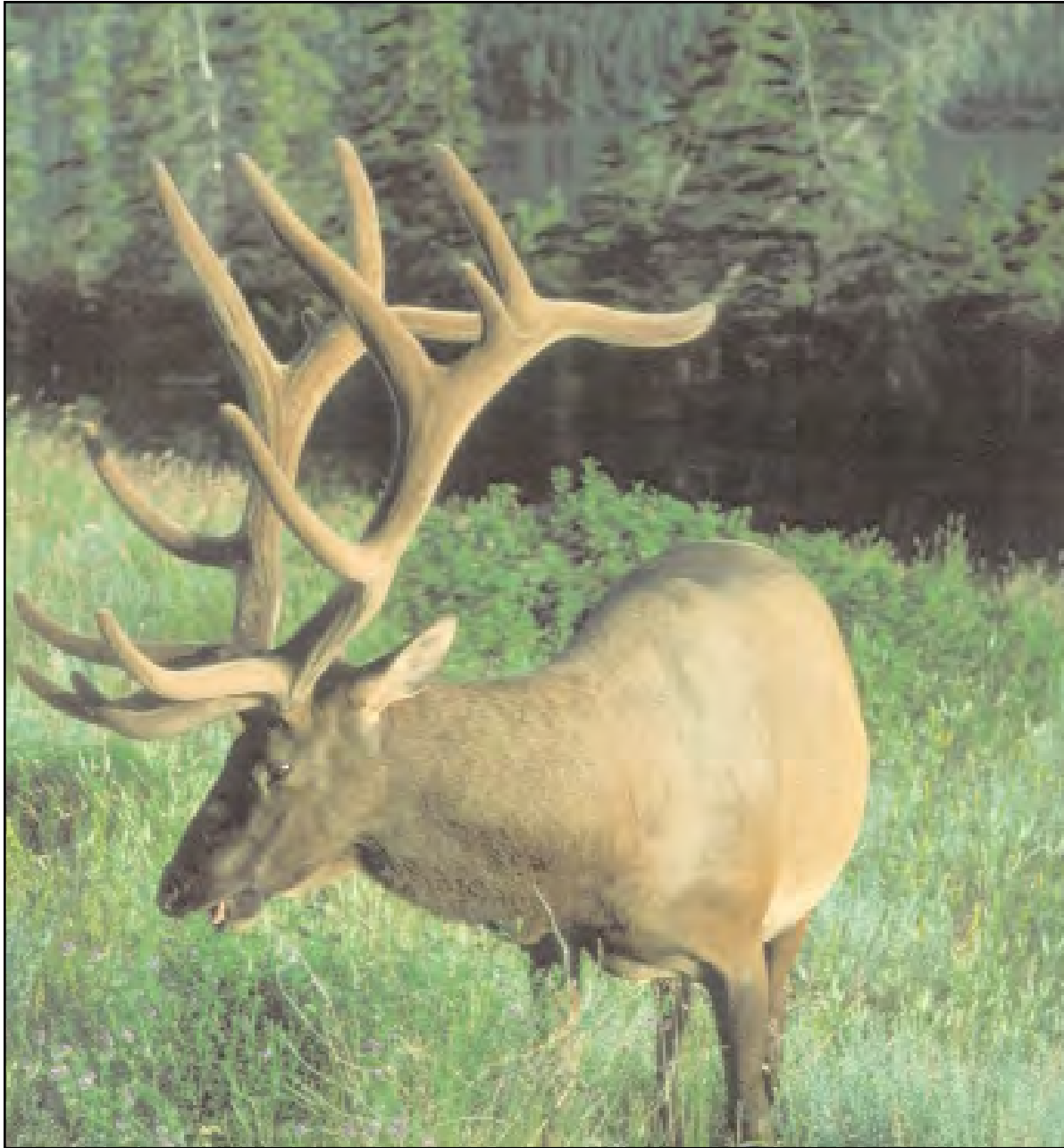
14

LUIGI MORGANTINI

WILDLIFE OF THE BIGHORN



The varied terrain and landscape, complex glacial history, diverse vegetation and climate of the Bighorn have created a wide and exceptional quality of wildlife habitat. The Bighorn Wildland provides certain habitats not available within adjacent national parks, especially critical wintering habitats. Park and Bighorn wildlife ranges often overlap, and much of the wildlife from adjacent national parks relies on habitats in the Bighorn at different times of the year.



WILDLIFE OF THE BIGHORN

The distribution of wildlife throughout the Rocky Mountains prior to 1900 is not well known. Reports from early explorers describe rich landscapes with diverse and abundant wildlife. However, by the early 1900s most large herbivores apparently had disappeared from the region. Over-hunting, severe winters and loss of habitat due to fire are considered among the factors contributing to the decline. But in the last several decades, wildlife numbers have rebounded.

THE GREAT MIGRATORS

The North American elk, or wapiti, was an abundant Alberta species in the late 1700s. David Thompson observed elk as “plentiful” along the Red Deer River, and fellow fur trader Alexander Henry hunted elk on the Kootenay Plains in the early 1800s. However, by the late 1800s elk had almost disappeared from the Canadian Rockies. Apparently only one small remnant population remained in west-central Alberta, on the Brazeau River. A few animals may have survived in secluded valleys within Banff and Kootenay National Parks. The current Alberta elk population is believed to have originated from the release of elk brought from Yellowstone National Park between 1917 and 1920. These elk interbred with native elk and possibly with elk moving in from British Columbia. By the late 1930s, elk were common throughout Banff National Park and present outside the park along the Panther, Red Deer and Clearwater Rivers of the Bighorn Wildland.

Brought back from the brink of extinction, the elk is once again a relatively common Eastern Slopes resident. The Bighorn contains some of Alberta's best elk winter habitat.

Today elk is one of the dominant, most widely distributed species in the Bighorn Wildland. It has been said, “To know the elk is to know the season,” for the seasons shape their lives. In autumn, as the leaves turn yellow and the first snow whitens the ground, male elk begin to gather harems. Valleys resound with echoes of bugling – the sound of bull elk during breeding season. In winter, with cold and snow limiting forage, female elk form small bands and disperse to lower elevations to forage in open or shrubby meadows, on gentle snow-free slopes and in the shelter of aspen groves. Bull elk, tired after the breeding season, disperse to suitable habitat in secluded valleys. Later in the year, females with their young may form large herds that concentrate along major river valleys, from the Panther and Red Deer Rivers in the south to the Clearwater and North Saskatchewan Rivers further north. One of the most important elk winter ranges in Alberta – the Ya Ha Tinda–Panther Corners region along the Red Deer River – is in the Bighorn Wildland.

Around the Ya Ha Tinda Ranch, the warm and dry microclimate has allowed the development of extensive grassland surrounded by lodgepole pine and aspen. The presence of fescue grass and relatively snow-free winter conditions make the meadows of the Ya Ha Tinda Ranch winter home to most of the elk from the northern half of Banff National Park. Every spring and early summer, following traditional routes and the receding snowline, as many as 2000 animals migrate from the Ya Ha Tinda to summer alpine ranges in the park, where they disperse across 1600 sq km of mountainous terrain. In autumn and early winter the animals, driven out of their high summer ranges by deepening snow, return to their winter range in the Ya Ha Tinda region. This annual migratory cycle covers between 52 and 138 km

and includes a cumulative height gain of 2000 metres. Such a remarkable elk migration is unique in Canada. Amongst ungulates, only caribou undergo similar extensive migrations.

Smaller, mostly resident, elk herds occur throughout the Bighorn Wildland wherever the combination of vegetation and topography provide suitable habitat. Migration is also a seasonal behaviour of these elk, although on a more limited scale. From lower elevation winter ranges they disperse in the summer to the surrounding upper foothills and alpine meadows.

Wildlife biologist Ian Ross, who loved these animals and died tragically in a plane crash in July 2003, photographed this treed cougar.





Although never common in the Bighorn, the mountain subspecies of Alberta's woodland caribou has had a continuous presence there until recently. The reasons for its decline in the Bighorn are unknown, although to the north, habitat loss due to clearcut logging and highway kills are considered primary limiting factors.

GREY GHOSTS

The Bighorn Wildland is home to the “grey ghosts” of the boreal forest – the mountain variety of woodland caribou. Mountain caribou are an endangered species in Canada and their numbers in the Bighorn Wildland continue to dwindle. The southern portion of their Alberta range includes the Bighorn Wildland, which has two distinct populations: one in the Jasper–White Goat area and the other some 20 km south, within the Banff–Siffleur Wilderness region. The distribution of the Banff–Siffleur population of some 25 to 40 animals used to include the upper Clearwater, upper Pipestone, Dolomite and Siffleur drainages within Banff National Park, and the Siffleur, Porcupine and Spreading Creek drainages within the Siffleur Wilderness Area. This group of mountain caribou appears to have declined since the mid-1900s, when their range reportedly extended 50 km or more east of the park boundary. What is left of the herd apparently has no interchange with other populations, and their very light-coloured pelage may indicate genetic isolation. In 1990 several people were startled when they came upon “grey ghosts” in the region of the Siffleur River. Unfortunately, since the late 1990s, no caribou have been seen in the area of this herd's historic range.

The Jasper–White Goat mountain caribou population contains some 150 to 200 animals. They range mostly within the confines of Jasper National Park, south of Highway 16. However, their range does extend into the Bighorn Wildland, from Cataract Pass to the Cline and North Saskatchewan Rivers. Animals from this herd are still occasionally sighted in the Upper Coral and Job Creek valleys.

These mountain caribou do not migrate long distances as do mountain caribou elsewhere. Rather, they remain in mountainous terrain year round, shifting from summer grazing on alpine meadows to nearby mature forests, where they feed on lichens and other palatable winter forage.

MAJESTIC BIGHORNS

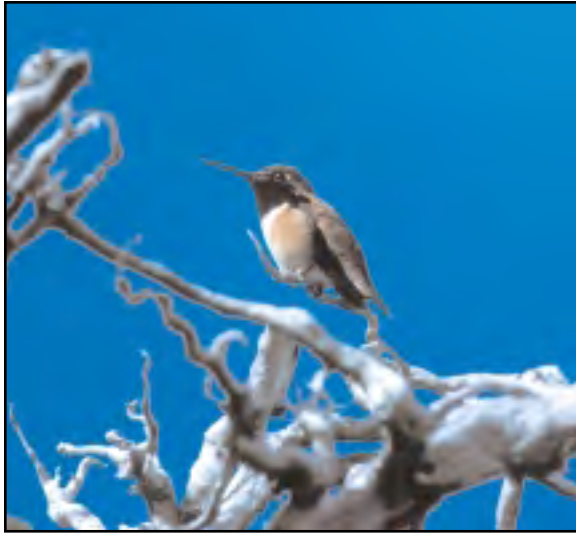
The Bighorn Wildland is of considerable importance for bighorn sheep. It provides summer and winter habitat for a population that may range as far west as Jasper and Banff National Parks and east of the Front Ranges to lower elevation habitats along the North Saskatchewan, Panther and Brazeau rivers. Bighorn sheep are often found on grassy subalpine and alpine slopes, usually near rough and steep “escape” terrain. In summer, they are widely dispersed throughout extensive alpine ridges and meadows. In winter, they occur on windswept south- and west-facing Front Ranges slopes. Some winter ranges in the Bighorn Wildland are critical to the survival of herds that spend summers in adjacent national parks. Just what drives bighorns back and forth between the national park and the Bighorn is not well understood. However, it is known that bighorn herds in the Panther Corners, Clearwater and Ram River regions of the Bighorn Wildland are also part of national park herds and therefore of national park ecology. Some herds, such as those all along the east side of the Front Ranges and along the Bighorn Range, remain within the Bighorn Wildland all year round.

In summer and early fall, bighorn rams tend to seek the company of their own gender and usually occupy higher, steeper, more rugged habitat than do the lambs and ewes. Individual bighorn sheep travel between herds in November and December, facilitating genetic exchange. Horn size determines dominance in rams, and the horns are used for defence, display, and to establish dominance through strength. Although rams generally live peacefully together, the larger animals with well-

matched sets of horns will establish who is king of the herd in dominance battles, where the cracking of horns together may be heard up to a mile away. Lamb and ewe herds tend to frequent gentler, open grassy slopes that are breezy enough to blow away pesky biting insects. Bighorn sheep can also be found in valleys, and small bands are occasionally seen grazing on lower elevation grasslands. They are attracted to mineral licks that may occur along the steep banks of small creeks or in dense shrubby meadows.

The bighorn sheep is ubiquitous in the Bighorn Wildland, where it ranges freely across Wilderness Area, Ecological Reserve and national park boundaries.





Rufous hummingbird. The male is elegantly coloured and is often attracted to bright colours worn by people.



Boreal owls are winged symbols of wilderness. This owl's summer home is an isolated and ancient stand of spruce along the Bighorn River.

THE BIGHORN'S BIRDS

by Rod Burns

The Bighorn Wildland provides habitat for a wide variety of birds from those common throughout the province to several that are unique to the Eastern Slopes.

A variety of birds are associated with the coniferous forest of the Bighorn's foothills, including the three-toed woodpecker, spruce grouse, boreal chickadee, winter wren and Townsend's solitaire. In spring and summer the colourful blue grouse is found on foothills slopes, but in winter it moves to higher elevations where food is easier to reach along windswept ridges. Elusive hawk owls, boreal owls and pygmy owls are resident during the breeding season and may occasionally be glimpsed at the top of a lone snag. The riches of the Front Ranges and foothills are important migration routes for birds of prey. Each year thousands of golden eagles pass through the area in spring on their way north to breeding grounds in the Yukon or Alaska, and again in the fall as they move south to wintering areas in the western great plains and northern Mexico.

On several swift-flowing streams, including the Blackstone and North Ram Rivers, dippers and rare harlequin ducks may be found. Dippers are easiest to locate during nesting season as they often nest near or even under waterfalls. Yellow-rumped warblers inhabit conifer trees. The

varied thrush calls beautifully from the crown of mature spruce, where it is often difficult to observe. White-crowned sparrows frequent thick cover at the forest's edge. There have been a few isolated sightings of the lazuli bunting between the Bighorn and the Front Ranges.

Some foothills birds are also found in the subalpine region, but the golden eagle and Wilson's warbler are true subalpine species. The golden-crowned kinglet and red crossbill frequent the tops of coniferous trees around treeline. Crossbills may occur in great numbers in areas where the spruce cone crop is heavy. The Clark's nutcracker may be found with limber pine, as in pockets along Dogrib Creek in the Panther Corners and on the Kootenay Plains. Nutcrackers breed in the subalpine and winter in nearby lower elevation forests.

Certain hardy species like the golden-crowned sparrow breed above treeline, in the krummholz colonies scattered at the edge of the alpine. Open alpine meadows and scree slopes are habitat for horned larks, American pipits and white-tailed ptarmigan. High above treeline, along cliffs and scree slopes, flocks of gray-crowned rosy finch spend the summer. All bird species either migrate from the area or descend to lower elevations for the winter.



This splendid specimen of the white-tailed ptarmigan is in full winter plumage and will convert to a pledge of mottled grey for summer, which will perfectly blend it into it's rocky surroundings.



Adult male harlequin ducks like these are unmistakable in their exotic feathered regalia. The harlequin duck is actually a maritime species that moves inland to the Rockies in summer where it breeds in the cold, fast waters of high mountain streams such as Wapiabi Creek.



Moose range throughout the Bighorn and old cast antlers indicate the bulls at least sometimes occupy high exposed ridges late into winter. Their numbers are currently low in the Bighorn, possibly due to a lack of fire-induced habitat.

“WHITE BUFFALO” AND OTHER HERBIVORES

Early European settlers called mountain goats “white buffalo” and First Nations peoples referred to them as the “wisdom of the mountain.” These impressive white-coated herbivores, widely distributed throughout the Bighorn Wildland, are associated with craggy mountainous terrain, rock outcroppings, cliffs, ridges and alpine tundra. In extreme weather conditions, they may seek the shelter of caves. Usually they choose to live close to the Continental Divide of the Rocky Mountains, although some herds occur in isolated pockets along the eastern boundary of the Wildland. Their rate of population growth is low in the Bighorn Wildland, possibly due to winter mortality amongst the kids that may be as high as 73 per cent. Several decades of protection from hunting is resulting in a slow increase in herd size.

The true buffalo, or bison, was also an abundant animal of the Bighorn in historic times. Remnant bones, especially skulls, are still occasionally found in the broader valleys throughout the Bighorn from the tributaries of the Red Deer northward, and even on the rugged tributaries of Job Creek. Undoubtedly early First Nations peoples followed the bison herds into valleys like those of the Sunkay, Wapiabi, Blackstone, Clearwater and Red Deer Rivers during their summer wanderings. Archaeological digs in the vicinity of Ya Ha Tinda Ranch confirm the use of bison as human food for thousands of years. Today in the Bighorn Wildland, wild horses occupy some of the range that the bison used to roam. However, unlike the bison, the wild horse is not migratory.

Among other herbivores, moose, mule deer and white-tailed deer are widely distributed throughout the Wildland. They are associated with deciduous and lodgepole pine forests, with shrubby, open meadows and gentle slopes. Hybrids between mule deer and white-tailed deer have been documented along the Red Deer River, and it is not uncommon to see the two species associating with each other throughout the Bighorn Wildland. Moose numbers are currently at a historically low level, perhaps due to a combination of wolf predation and a lack of their main forage – young willows – because of fire suppression.

The “white buffalo,” as it was called by early Europeans, is making a slow recovery of numbers in the Bighorn after hunting of mountain goats was banned in the 1980s.





The majestic grizzly, the quintessential symbol of wilderness, can be found in most Bighorn habitats. Their numbers province-wide, however, are dangerously low. Long-term survival of grizzlies is dependent on maintaining large wilderness landscapes such as the Bighorn Wildland.

FUR-BEARERS

The wilderness nature of the Bighorn Wildland provides ideal habitat for wildlife species such as cougar, wolf, grizzly and black bear, lynx, marten, weasel and rare wolverine and fisher. Little is known about the abundance of predators in historic times. It is believed that in the early 1900s, when ungulate populations were low, wolves and cougars were also scarce. However, as ungulate numbers increased, predators have correspondingly rebounded.

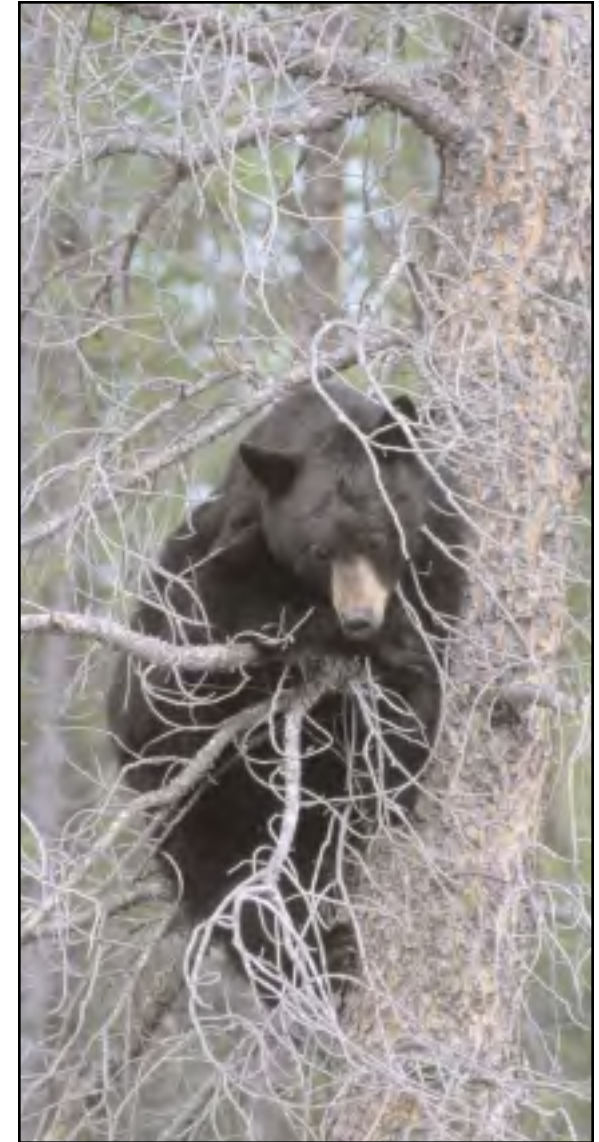
Bordering the protected confines of two national parks, the Bighorn Wildland provides secure habitat for cougars and wolves. In the 1950s and 1960s, these animals fluctuated in number in response to predator control programs inside and outside the parks. Today the Bighorn Wildland is home to several wolf packs that follow their prey along all the major river valleys, in and out of the parks. Less is known about the current abundance and distribution of cougars. However, in 1992 the cougar density of the region was estimated between 1.5 and 2 animals per hundred sq km. Cougars feed on a variety of prey, from grouse and porcupines to deer and elk. They have been seen stalking bighorn ewes on open slopes.

Grizzly and black bears are widely dispersed within the Bighorn Wildland, but little is known about their distribution and movements. Grizzly bears, especially the males, range over very large territories. The home range of an individual grizzly bear can extend over more than 1000 sq km, so could include parts of the Bighorn and both Jasper and Banff National Parks. As bears emerge from hibernation, they move onto low elevation shrubby slopes and meadows looking for over-wintered berries and the carcasses of elk, moose or deer that

succumbed to winter. With green-up and receding snowlines, grizzly bears shift their foraging to grasses, sedges and forbs, and gradually move to higher, open meadows along the western sections of the Wildland. There are currently healthy populations of wolves and grizzlies in the Bighorn.

The commercially used fur-bearers of the area have received almost no scientific examination. Trapping has been a historic use of the Bighorn Wildland, dating back to at least the end of the eighteenth century and the early Rocky Mountain House trading posts of David Thompson and Alexander Henry. Marten, coyote, wolf and beaver are amongst the primary pelts now taken. Historically, lynx, wolverine and fisher were prized catch animals.

The small fur-bearers, such as mice and voles, packrats, ground and tree squirrels, chipmunks, marmots, pikas and hares, are often overlooked. However, their contributions, especially as prey and as distributors of seeds, are vital to the functioning of the diverse ecosystems found in the Bighorn Wildland. Protection of the variety of habitats that can sustain viable populations of these small creatures is essential for the well-being of all the larger mammals and of the fish and birds.



*This black bear, *Ursus americanus*, is surveying his situation from a tree branch. Tree climbing is quite common for this species, and observant explorers of the Bighorn may find characteristic claw marks on trees throughout the area. Escaping a black bear by climbing a tree is unwise.*

TABLE 1.
FISH SPECIES RECORDED FROM THE BIGHORN WILDLAND AREA

Source: Nelson and Paetz (1992)

Burbot	<i>(Lota lota)</i>
Lake chub	<i>(Couesius plumbeus)</i>
Pearl dace	<i>(Margariscus margarita)</i>
Longnose dace	<i>(Rhinichthys cataractae)</i>
Brook stickleback	<i>(Culaea inconstans)</i>
Spoonhead sculpin	<i>(Cottus ricei)</i>
Longnose sucker	<i>(Catostomus catostomus)</i>
White sucker	<i>(Catostomus commersoni)</i>
Mountain sucker	<i>(Catostomus platyrhynchus)</i>
Mountain whitefish	<i>(Prosopium williamsoni)</i>
Bull trout	<i>(Salvelinus confluentus)</i>
Golden trout*	<i>(Oncorhynchus aquabonita)</i>
Cutthroat trout*	<i>(Oncorhynchus clarki)</i>
Rainbow trout*	<i>(Oncorhynchus mykiss)</i>
Brown trout*	<i>(Salmo trutta)</i>
Brook trout*	<i>(Salvelinus fontinalis)</i>
Lake trout	<i>(Salvelinus namaycush)</i>
* <i>introduced species</i>	

TABLE 2.
HIGH MOUNTAIN LAKES LOCATED WITHIN THE BIGHORN WILDLAND THAT
HAVE BEEN STOCKED WITH CUTTHROAT TROUT

Eagle Lake	Entry Lake	Lost Guide Lake
Ice Lake	Kinglet Lake	Obstruction Lakes
Lake of the Falls	Landslide Lake	

THE BIGHORN'S FISH COMMUNITY

by K. A. Zelt

Of the 51 native and eight introduced fish species found in Alberta, 12 native and five introduced species are recorded within the Bighorn Wildland area (Table 1).

Aside from the Red Deer River to the south, the major portion of the Bighorn Wildland falls within the North Saskatchewan River system. The Ram, Clearwater and Brazeau Rivers contribute to the main stem of the North Saskatchewan River. The main stem systems and their tributaries are predominantly coldwater fish habitats, where summer water temperatures range from 10° C to 18° C.

There are very few lakes within the Bighorn Wildland, and the majority occur at high elevations. Long periods of ice-cover and low water temperatures limit their fish-producing capabilities. In 1974 the BigHorn Dam was completed, resulting in the creation of Abraham Reservoir. The reservoir provides over-winter fish habitat; however, the presence of glacial silt and the annual drawdown limits the development of rooted aquatic plants, which are necessary for fish production.

The predominant native game fish species, distributed throughout the area, are mountain whitefish and bull trout. The presence of waterfalls in the upper reaches of many streams limits the movement of the two species. Both utilize the spawning habitats of major streams. The Clearwater River and its tributary, Timber Creek, are historically important bull trout spawning streams. Recent surveys on the North

Saskatchewan River above Abraham Reservoir have indicated a modest population of mature bull trout, and several tributary streams were identified as spawning and rearing sites. Pinto Lake, located within the Cline River drainage, supports a unique native population of bull trout that is able to successfully spawn in the outlet stream from the lake. Because of the vulnerability of bull trout to angling, Pinto Lake was closed to fishing in 1989, and the bull trout limit for the entire province was reduced to zero in 1998. This non-harvest strategy is designed to allow for the recovery of this native fish.

Specimens of lake trout, a native species, are collected periodically from the Upper North Saskatchewan River, above Abraham Reservoir. These fish are thought to be possible downstream migrants from the stock in Glacier Lake within Banff National Park.

In 1977 golden trout obtained from Wyoming were stocked into Coral and Michele Lakes. Golden trout are a unique species adapted to high altitude lakes. Both of the populations in Coral and Michele Lakes have sustained themselves naturally; however, their survival depends upon limited harvest and habitat protection for the inflowing tributaries and outlet stream.

In 1955 a West Slope strain of cutthroat trout, obtained from southeastern British Columbia, was stocked into fishless areas above waterfalls within the Ram and North Ram Rivers and was successful in establishing reproducing populations. These introductions have resulted in the Ram River system offering good trout fishing.



This West Slope cutthroat trout is a pure form of wild native Alberta cutthroat trout. The markings and colours are distinctive and easily recognized by the anglers who enjoy this high-spirited catch.

In 1965 Job Lake was stocked with cutthroat trout obtained from Marvel Lake in Banff National Park. This stock was able to spawn in the outlet stream and successfully reproduce in the lake. In 1971 the lake was closed to sport fishing and designated as a cutthroat trout brood stock source for Alberta's trout stocking program. Spawn collected from Job Lake is incubated at the Sam Livingston Hatchery in Calgary. The resultant fry are reared to fingerling size and are subsequently stocked in other locations. Job Lake was opened to sport fishing for a number of years until stocks dwindled, and it has been closed since 1989.

Within the Bighorn Wildland, cutthroat trout produced from Job Lake have been stocked elsewhere with the goal of establishing self-reproducing populations. They have been put into the Bighorn, Panther, Red Deer and Blackstone

Rivers, and into Wapiabi, Brown and Chungo Creeks. The distribution of sizes collected by fisheries biologists in 2001 suggest that successful spawning of the stocked fish has occurred in Wapiabi, Brown and Chungo Creeks. Job Lake cutthroat trout are also used to provide sport-fishing opportunities in alpine lakes within the Bighorn Wildland. Since reproduction is not possible within these systems, the lakes are stocked on a regular schedule (Table 2).

Brook trout, brown trout and rainbow trout are occasionally collected within the mainstem North Saskatchewan and some of its tributaries. These trout specimens are undoubtedly the descendants of historically introduced fish. Hatchery-produced brook trout are still stocked on a regular basis into Dormer and Allstones Lakes.

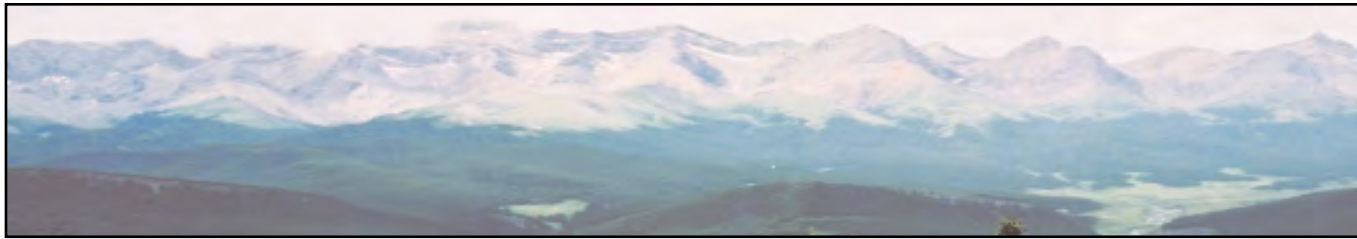
FIRST NATIONS



15

ANDY MARSHALL

FIRST NATIONS



A European-centred perspective still tends to view the first white explorers' sojourns into the foothills region and beyond as the beginning of real history in the West. Yet archaeological evidence suggests that First Nations people inhabited the Bighorn Wildland at least 9000 years ago and reveals a long and deep connection with the region. Through carbon dating and other scientific methods, we know that artifacts found in the area go back as far as 5000 years. They show a pattern of fairly regular winter camping for several thousands of years after that. In other words, First Nations people savoured the glories and natural abundance of the Bighorn for many hundreds of generations before the arrival of the first European people. Their occupancy of the region had clearly intensified by the time people like David Thompson and Alexander Henry passed through in the early nineteenth century.



FIRST NATIONS

The earliest-known nomadic people in the Bighorn region were the Upper Kootenay, part of the Ktunaxa Nation, who made their home in a large area including southeast British Columbia, western Montana and northern Idaho. The Kootenay travelled throughout their territory, moving from place to place as food sources became seasonally available. The people who came into the Bighorn likely made their way from the Columbia River beyond Golden through the Howse Pass, attracted by the herds of bison wintering on the nutrition-rich grasses in the region's wide valleys. After their hunting forays, the Kootenay people likely took dried meat and pemmican back to their more permanent settlements to the west. While the focus of archaeological work and land claims has been directed at the Kootenay Plains and Ya Ha Tinda areas, the Kootenay people ranged throughout the Eastern Slopes, Frontal Ranges and valleys of the Bighorn.

There is also evidence of the Assiniboine (descendants of the Dakota Sioux, who formerly occupied the headwaters of the Missouri River) moving into the area about 500 years ago. In the past two centuries, the Stoney Nakoda First Nation (also Sioux descendants) moved into the region. Even more recent were the arrivals of the O'Chiese group, part of the Saulteaux Nation, and the Sunchild of the Cree Nation from Saskatchewan after the second Louis Riel rebellion in 1885.

Ornaments have special meanings and many of the handmade outfits worn at pow wows are cherished and may be made by a family member. Dressed in traditional costume, this beautiful young girl is a member of the Big Horn Band and lives on the Big Horn Reserve.

Although we have less ongoing evidence of their activities, a number of other tribes inhabited the region by the 1700s, before the arrival of the Stoney, O'Chiese and Sunchild. Territorial boundaries were not definitive and fluctuated constantly. The Peigan and the Blood, who joined the dominant Blackfoot people to become part of the powerful Blackfoot Confederacy, were among these groups. The Sarcee people, now the Tsuu T'ina Nation near Calgary, once occupied the upper North Saskatchewan River area and enjoyed a loose alliance with the Blackfoot.

Coincidental with its acquisition of guns early in the eighteenth century and the introduction of horses, the Blackfoot Confederacy gradually forced the Kootenay westward across the Continental Divide. The Blackfoot territory continued to expand, soon extending from the North Saskatchewan south to the headwaters of the Missouri River, and from the Qu'Appelle River in central Saskatchewan to the Rockies. Nomadic bison hunters, the Blackfoot undoubtedly occupied part of the Bighorn region. Because of the apparently more warlike behaviour of the Blackfoot, the white settlers remained wary of them. However, the fur trade flourished with the help of the First Nations tribes, leading to the building of Rocky Mountain House in 1799.

The Plains Cree, centred in northern Saskatchewan and Manitoba, were also relatively late arrivals to central Alberta and were able to act as middlemen between the fur companies and the western tribes. Diseases introduced by the whites later took their toll, as did the introduction of liquor. The signing of the treaties in the 1870s prompted further dramatic changes to the lives of

all First Nations people and placed, in many of their eyes at least, punitive restrictions on where and how they could carry on their traditional ways of life.

The Wesley Band of the Stoney Nation is the only group still occupying any part of the Bighorn. A couple of hundred people live on the Big Horn Reserve, for which they use the Stoney word *Wapta Mnotha* meaning "Loon River." It is located northeast of the Kootenay Plains near what is now Abraham Reservoir. The land entitlement formally took effect in 1948.

The Wesley Band, and likely other Stoney bands, occupied the Kootenay Plains for many generations and established themselves during the nineteenth century as a large, thriving community living along the Brazeau, North Saskatchewan, Clearwater and Red Deer River watersheds. They had semi-permanent campsites at other places including the Ya Ha Tinda, Swan Lake, Burnt Timber Lake and Buck Lake. To this day, the Kootenay Plains and other parts of the Bighorn Wildland continue to serve as a productive hunting area and an important location for traditional ceremonies and encampments.

Like the Wesley, some members of the O'Chiese and the Sunchild strive to hold onto the lifestyle of their ancestors, hunting for elk and moose (the bison have long since disappeared, of course), gathering berries and harvesting plants for medicinal purposes. Sundances and other spiritual activities still take place regularly on the Kootenay Plains. The annual Big Horn Pow Wow, now called Kiska Waptan, is a major event.



The wolf, ever fascinating and revered, occurs in good numbers in parts of the Bighorn. Its lonely calls often linger in the night air along the Sunkay and Wapiabi Creeks.



Pow wows are celebrations, social gatherings and dance competitions. Some of the regalia worn by the dancers signify special events or honours, special religious traditions or symbols rooted in legend.

CULTURE

No known archaeological work of any significance has been done in the Bighorn region since Brian Reeves, a former University of Calgary professor and consultant, completed a study before the North Saskatchewan was flooded for the Big Horn Dam, which created Abraham Reservoir. Based on his discovery of about a hundred sites in the region, Reeves drew a picture of thousands of years of winter occupation by groups of 50 to 100 people of all ages. Bone and stone scrapers, knives, arrowheads and butchered bones form part of the evidence. Chert mines along Shundra Creek suggest use of the area as a tool-making site for thousands of years. Signs were found of mat lodges, likely made from woven reeds easy to carry across the mountains. Ten or 12 of these lodges might be built at a single campsite. Reeves speculated that there might still be hundreds of unexamined sites in the area.

The Kootenay or Ktunaxa language was quite distinct from those of other First Nations, but as with other Nations, all people, from elders to the children, had a place in the community. Elders were the leaders, responsible for making decisions and teaching each new generation the ways of life. The men's job was to go hunting, while the women were responsible for making clothing, cooking meals and gathering food. Children in the camp did a variety of tasks, from helping gather firewood to running errands for the elders. For clothing, men wore buckskin shirts with a full collar made from two hides, leggings, breechcloths and moccasins. The women wore undecorated skin frocks and soft, knee-length leggings during the colder months. Hats were made from rawhide, fur and pliable willow twigs.

Archaeologists have found signs of vision quest sites and circular, oval or horseshoe-shaped cairns. These likely date to relatively recent times and the arrival of the Assiniboine. Today there are about one hundred documented burial sites along a single trail in the northern Bighorn. Rock art is believed to be associated with vision quests. Although there are likely more in the region, the only known rock art, a series of lines on a rock, has been found in the upper Cline River and could be up to 1000 years old.

It is not surprising that many First Nations people look back with longing to their extended period of residency before the white men came with diseases and weapons of war. Scientists believe the Kootenay, for example, generally lived much longer than Europeans before modern medicine was developed. Living in the great outdoors, subsisting on a diet of usually abundant meat and plants, most people remained relatively disease-free and many lived well into their seventies and eighties.

The Assiniboine and Stoney people likely moved around the area in smaller numbers than the Kootenay. Unlike the prairie Nations, who depended on the much larger bison herds, they lived a more scattered existence, looking for mountain game that occurred singly or in small groups. Teepees were made from cured animal hides stitched together with sinews and supported on the long pine-tree trunks. Bows were made from chokecherry or birch, and the string from the long sinews of deer or bison backbones. Arrowheads were carefully chipped from traded flintstone. A hide scraper was made of stone or a large leg bone, while a fishhook was made using a thin, pliable bone from a lynx's front leg. Although survival was undoubtedly a challenge and conditions often harsh, the ability to obtain food and comforts from natural surroundings often seems idyllic to modern sensitivities.

EUROPEAN CONTACT

The Stoney believe that the pre-contact era was a time of great happiness, peace and prosperity for their ancestors, the original inhabitants of the area. They lived in harmony with nature, and the Great Spirit provided for all the needs of the people. The country was rich with game, and there was lots of food and land for all the people. The land belonged to the people. The Great Spirit had made the country and had given everything in it to their people to use.

Although it ultimately disrupted their way of life, many Nations at first welcomed the early Europeans, acting as guides and in other capacities. Given the importance of the Kootenay Plains, it is not surprising that a fur trade presence was established there. Although accurate information about activities in the region before the eighteenth century is in short supply, it is clear that the lucrative trade with white men attracted First Nations from a wide area. Traditional economies became dependent on visits to the trading posts. Guns, axes, knives, kettles and other items soon became essential. In addition to their goods, the newcomers also brought diseases – from measles and smallpox to tuberculosis and venereal disease. The area was incorporated into Canada in 1870, and treaties were introduced. Although many bands sought to maintain their way of life, the final disappearance of the bison in the 1880s forced most to return to the government-surveyed reserves to try and forge a new and unfamiliar way of life.



This majestic wapiabi (“grave” in Stoney) is found in the Wapiabi Valley. Visitors to this site are often greeted with the call of a red-tailed hawk, announcing the arrival of guests to this Stoney gravesite.



Each year thousands of golden eagles pass through the Bighorn Wildland, an important migration route for birds of prey. Recently, eagle-capture pits used by ancient peoples were recognized on Ya Ha Tinda Ranch property.

TREATIES AND LAND CLAIMS

Detailing the signing of the treaties with the various First Nations groups is beyond the scope of this book. However, it is interesting to note that the territories covered by Treaties 6, 7 and 8 intersect in the southern part of the Bighorn, complicating their impact on the region. Interpretations of the intent of the treaties vary, understandably, depending on who one speaks to. From the point of view of the Stoney, for example, the misunderstandings surrounding the treaties have been deep and serious.

For the European settlers, the treaties were a way of making peace with the aboriginal peoples and establishing certainty for their own expanding commercial and territorial needs. The federal government wanted title to the entire North West Territories – including Alberta – so they could be developed for the white men. Because of considerable cultural and language barriers, the First Nations representatives might have had quite a different perspective on what they were signing. They, too, wanted peace, but interpretations today suggest they did not realize they were handing over the rights to land which they had once freely occupied. Issues such as title to land or strict formula for establishing the size of reserves did not mean much to them.

Treaty 6 was signed in 1876, mostly by the Cree people of what is now Saskatchewan and central Alberta. It included a provision for agricultural implements and seed grain, plus a promise to give rations in the event of famine. The Treaty 6 territory was bordered in this part of Alberta by the Red Deer River in the south and the Eastern Slopes in the west, as shown in the maps published

in John Snow's book, *These mountains are our sacred places*. Thus, most of the Bighorn area is in Treaty 6 territory.

From a geographical point of view, it would have been more logical then for the Stoney settlement to have been part of Treaty 6, an adhesion to it, or even Treaty 8, which includes what is now Banff National Park, and extending north. Nevertheless, it became part of Treaty 7, signed in 1877. The northern boundary of Treaty 7 territory is the Red Deer River, with the western boundary being what is today the British Columbia border. A prime motivation for the white settlers to have Treaty 7 signed was to make peace with the Blackfoot people further south.

For First Nations people, at least, the setting of the geographical boundaries created a serious oversight that is the source of resentment and controversy to this day. The Kootenay Plains area in the Bighorn was omitted from all the treaties. The discrepancy was not discovered until the signing of Treaty 8 in 1899. But the Stoney of the Bighorn–Kootenay Plains were not invited to participate in the Treaty 8 settlement. Nor have they been permitted to sign an adhesion to any treaty since. Former Chief Snow speculates one of the reasons was that the Kootenay Plains group was quite small, and the treaty commissioners, in their haste to resolve these matters and without sufficient background information, simply overlooked the group.

The O'Chiese Reserve, east of the Bighorn boundaries and about 50 km north of Rocky Mountain House, was officially recognized in 1950 as an adhesion to Treaty 6; the Sunchild had signed an agreement shortly before that. The O'Chiese, too, have ongoing claims on the Kootenay Plains, which remain unresolved to this day.

After many years of petitions and promises (some broken, according to Stoney records), the Wesley First Nation's claim to the Kootenay Plains was finally recognized in 1948 with the creation of the 5000-acre Big Horn Reserve. The Wesley have a specific claims process under way to expand their territory. Further claims from the O'Chiese and the Sunchild are also still before Canada's federal court.

As we have alluded to, for the Stoney and other First Nations people, the signing of the treaties was tarnished by misunderstanding and even treachery. Given the importance to Stoney history of the return of the Kootenay Plains, it is remarkable how little is known about the details. But when the provincial government was preparing in 1972 to launch the Big Horn Dam and flood historic Stoney gravesites, Bill Yurko, a senior member of the newly elected Progressive Conservative government of the time said: "These people have lived in this land for centuries. The fact that we are now flooding the land where their ancestors were buried, and where buildings of historical significance are located, places us under an obligation to provide land for a sacred, historical site."

That obligation was partially met in the mid-1970s when a section of land by Two O'Clock Creek was given special status. However, bearing in mind the broader historical context, conservationists may understand better why First Nations people have not always greeted with enthusiasm their attempts to set aside the Bighorn Wildland as a natural, protected area. Chief Snowss charged in the early 1970s that a provincial natural area in the Kootenay Plains had been established without consultation at the place traditionally used by the Stoney for sundances, and that this action appeared to be a "deliberate attempt to destroy our culture." The chief also criticized Alberta's stewardship of the

grasslands at the Plains, claiming the Stoney could care for them better.

During discussions in the past three years between environmentalists and the province over the issue of protection for the Bighorn Wildland, the then-head of the O'Chiese Nation voiced his concern that his people had been left out. "The O'Chiese First Nation has strong traditional ties to some of the Crown lands within this area," said Danny Bradshaw.

Although the historical details are still somewhat sketchy, we can strive for a better understanding of First Nations ties with the Bighorn, particularly the Kootenay Plains area. As we hike or ride along the Bighorn's magnificent trails and camp by its life-giving streams and lakes, we can meditate on the numerous people who have gone before us under dramatically different circumstances. We can try to recall their experiences, their perspectives and their connections with the relentless and mystical rhythms of the region.



This tree is marked with cuts that a Stoney elder explained represent the number of days spent travelling to reach this site. It is found near the beginning of the historic Bighorn Trail, about two km above the Bighorn River.

EARLY EXPLORATION



16

JOYCE McCART

EARLY EXPLORATION



*The nineteenth century marked the appearance of the first Europeans in the Bighorn Wildland.
They came for a variety of reasons – trade, science, adventure – but their
presence was light, and the only sign of their passage is
the writing they left behind.*

*Four individuals in particular, all of whom kept journals, typify these early visitors:
David Thompson, James Hector, the Earl of Southesk and Mary Schäffer.*



From rocky outcrops like this one, magnificent mountains and wide sweeping valleys inspired early explorers and photographers. This photo is from the Archives of the Canadian Rockies.

EARLY EXPLORATION

Of the four, the first to venture into the Bighorn was David Thompson. He was 30 years old, recently married and employed as a fur trader by the North West Company. Born in obscurity and educated by charity, Thompson was an unlikely candidate for fame, but once his maps and journals surfaced (some 30 years after his death), he began to be recognized as the determined explorer and master geographer that he was.

During the first decade of the 19th century, Thompson explored three different areas of the Bighorn – the Ya Ha Tinda, the North Ram River and the Kootenay Plains. In the fall of 1799, he was stationed at Rocky Mountain House, and when word came that a band of Kootenays was coming across the Rockies, Thompson decided to meet them. The ride took him west along the Red Deer River, through miles of forest, to the edge of a broad plain. There he climbed a “very high knowl,” and wrote the first description of the spectacular view from the Ya Ha Tinda Ranch.

YA HA TINDA 1799

“I had a very extensive View of the Country: from the southward extending by the westward to the North, it was every where Ranges of woody Hills lying nearly parallel to the Mountain, and rising one behind another higher and higher to the snowy Summits of the Mountain” (Belyea 1994, 6).

The following spring, Thompson was part of the first attempt to carry the fur trade across the Rockies. By June 13, 1800 the expedition was well

into the Ram Range of mountains – nowhere near, however, where Thompson wanted to be. His “useless guide,” instead of following the North Saskatchewan (as the Kootenays had advised), had crossed the river and led the expedition up the North Ram River to its headwaters in Mud Lake. And there the trail came to an end.

MUD LAKE 1800

“For the last 1/4 of a Mile we were on a bare Spot tolerably exposed to the Action of the Sun – here we were obliged to stop, for at the end of this was a deep Lake...whose eastern Side rose abrupt & hid its Head in the Clouds, accessible to the Eagle only, & its western Side, equally lofty but broken, denied us a farther Road with the Horses” (Belyea 1994, 29).

Thompson pushed on to the far end of the lake and scrambled over the divide. Below, he could see Whiterabbit Creek, and he figured they could reach the North Saskatchewan if they carried the packs down the mountain. But the men swore the slope was impossible to descend without “breaking their limbs,” and much to Thompson’s disgust, the expedition turned back.

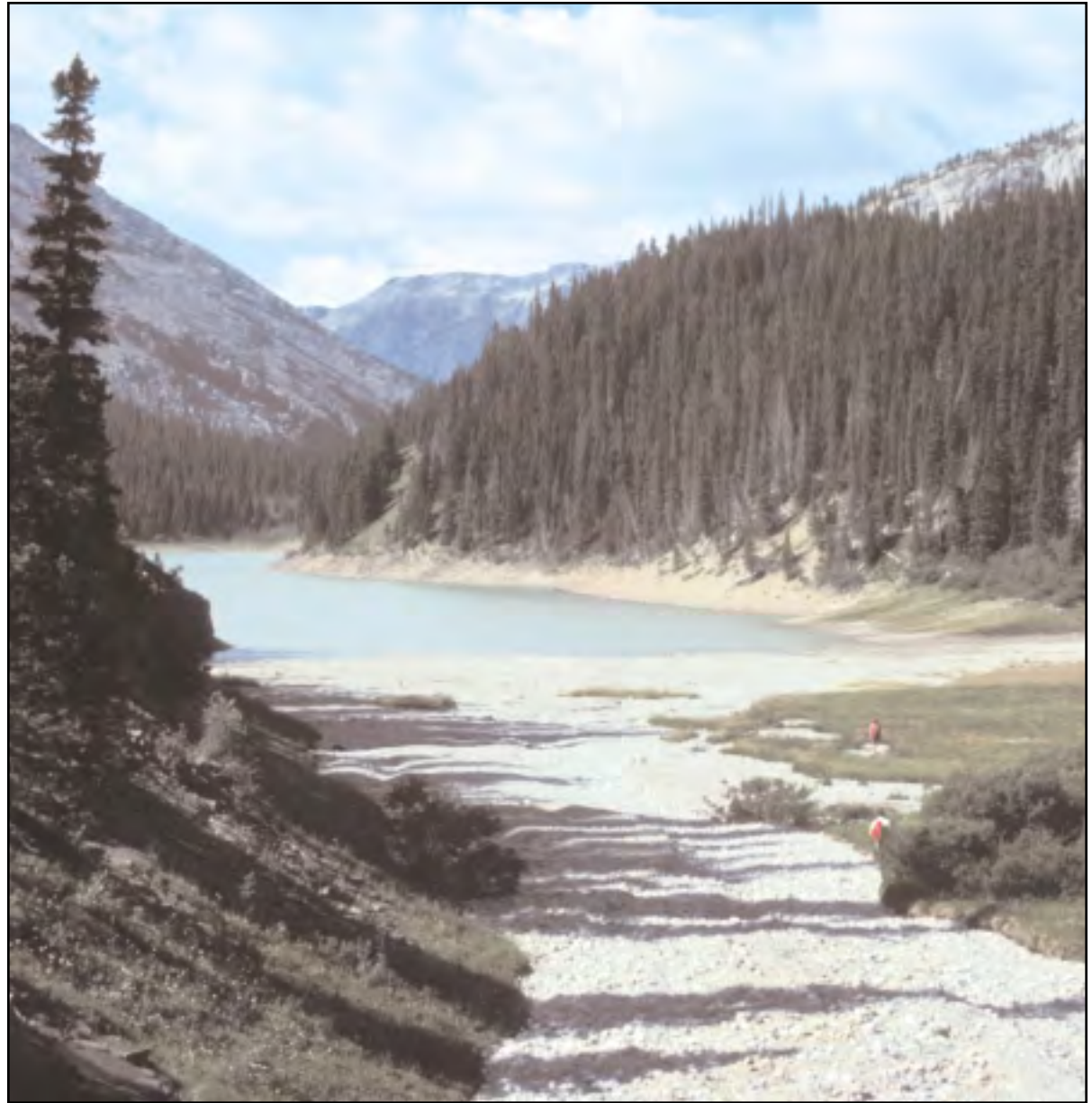
Seven years went by before he was given a second chance at the Rockies. On May 10, 1807 he dispatched a loaded canoe up the North Saskatchewan, then followed on horseback with a cavalcade of packhorses, hunters, women and children. Three weeks later, the riders emerged from the wreckage of a burnt forest, crossed Windy Point, and rode out onto the Kootenay Plains.

KOOTENAY PLAINS 1807

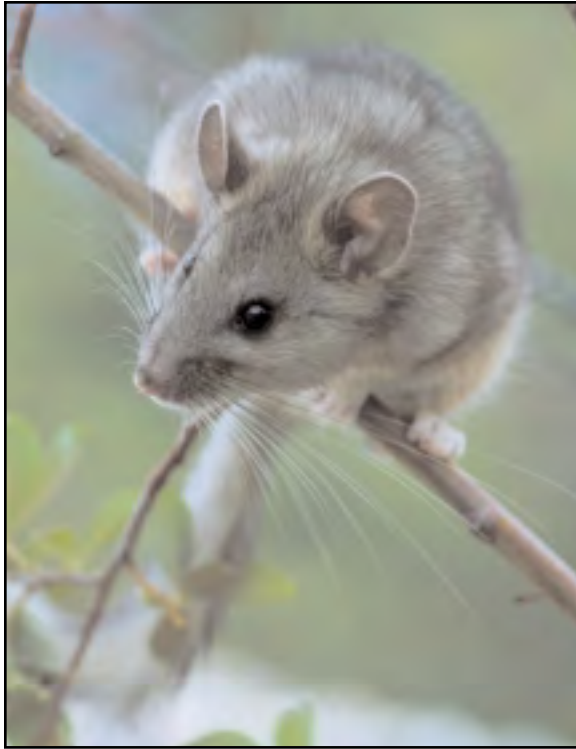
"[Course] thro' the Kootanae Plains, where we put up near the Canoe & People – we came fast on, often at a sound Trot. The Valleys, notwithstanding the rugged snowy appearance of the Chain of Mountains about us, are pleasant, & one might pass an agreeable summer in such places we have come thro' the last 4 Miles" (Belyea 1994, 41).

The travellers camped near Two O'Clock Creek, where they stayed until the mountain snows melted. On the third of June, Thompson and his retinue headed west to cross the Howse Pass, a move that put the Kootenay Plains on the North West Company's trade route across the Rockies. But that traffic – if twice yearly can be called traffic – lasted less than four years. In the summer of 1810 the Hudson's Bay Company's Joseph Howse crossed the pass that now bears his name for the first and last time, and that fall, the increasing hostility of the Peigans drove David Thompson north in search of a safer route. With the opening of Athabasca Pass in 1811, the fur trade disappeared from the Kootenay Plains.

Half a century later, science came to the Bighorn Wildland. It arrived in the person of an energetic young Scot named James Hector – 24 years old, a recent graduate of medical school and a member of the Palliser Expedition. Hector's first love was geology, but in the mid-nineteenth century, natural science was a branch of medicine, and in order to study geology, he'd had to become a doctor. It was in the field of geology, however, that he made his name. In New Zealand, he is remembered as Sir James Hector, head of the New Zealand Geological Survey.



Mud Lake marked the end of the trail for David Thompson in 1800. The terrain beyond the lake proved impassible to horses, thwarting Thompson's efforts to cross the Rockies and establish a fur trade in British Columbia.



Packrats live in nests built of plant material like branches, twigs, sticks and other debris. They can become quite a nuisance, getting into everything, stealing treasures and generally causing havoc. No doubt early explorers dealt with a packrat or two.

The fur trade had a major influence on western culture. The Bighorn Wildland was rich with wildlife and trap lines were established early. Many trap lines remain today. Early trappers built boxes for trapping martin. Martin boxes like this one remain as evidence of this area's rich history.



Hector made two visits to the Bighorn – the first in September of 1858 (a few weeks after he was kicked by a horse on the banks of the Kicking Horse River); the second a year later. Not surprisingly, Hector looked at landscapes in terms of their geology, and his first act on reaching the upper North Saskatchewan was to climb Pine Point (now Whirlpool Point) for a bird's-eye view of the Kootenay Plains.

KOOTENAY PLAINS 1858

“The terraces along the edges of the Kootanie Plain are beautifully marked, rising successively many hundred feet above the river. The surfaces of the higher ones are covered with cypress pines of sturdy growth, but free from underwood. The widest terraces are quite free from timber of any kind, excepting only in the ravines where there are poplars and small cherry trees” (Spry 1968, 327).

From his campsite on Two O’Clock Creek, he climbed 1128 metres up Mount Ernest Ross and devoted a page of his journal to detailing the strata of Two O’Clock Ridge. As he continued to ride north, he listed the quartzite and limestone, gravel and sand of the terraces enclosing the North Saskatchewan (now the banks of Abraham Reservoir), and noted the “ledges of quartzose sandstone” that once churned the river into rapids.

Hector’s last notes before leaving the plains concerned the Cline River. A Stoney hunter had told him the track along the river was Old Cline’s Trail, and that years before, fur trader Michael Cline had made an annual trek from Jasper House to the Kootenay Plains to provision his post for the winter. The river itself had yet to be named, though it wasn’t for want of trying. David Thompson had called it the Muleton (possibly a misprint for Mouflon, French for mountain

sheep); James Hector named it the Wapateehk (or Waputik, Stoney for “white goat”); Mary Schäffer referred to it as the Cataract (now a falls on the river); but it was 1902 before alpinist Norman Collie finally named it the Cline.

Hector’s second visit to the Bighorn was marginally longer than his first one. He reached the Kootenay Plains on August 28, 1859, this time by following a First Nations trail up the Pipestone River to Pipestone Pass.

SIFFLEUR WILDERNESS 1859

“After crossing the highest point, we made a gentle descent for five miles over a bleak moorland...we then came to the brink of a densely wooded valley...The next day descend along the Siffleur River, a very rapid stream...travelling by a path cut through very dense woods. At nightfall...we reached the wide open valley of the North Saskatchewan opposite to the Kootanie Plain” (Spry 1968, 442).

Hector named the Siffleur River (French for “whistler”) after the cheeky little marmots that whistle along the trail. The next morning, he rode across the plains to the North Saskatchewan and set up a camp opposite Whirlpool Point. Over the next four days, his men shot a moose, an elk and five bighorn sheep, then turned most of the meat into pemmican. On September 3 Hector paid the hunters, loaded his horses and set out to cross the Howse Pass.

Soon after, a Scot named James Carnegie, the Ninth Earl of Southesk, arrived in the Bighorn Wildland. Southesk was 32, a recent widower and currently on safari for the benefit of his health. As befitted a person of rank, his entourage consisted of a party of men, an Iroquois cook and a string of packhorses loaded with guns and trophies, tents

and bedding, a table, a camp stool, a rubber bath and the works of William Shakespeare.

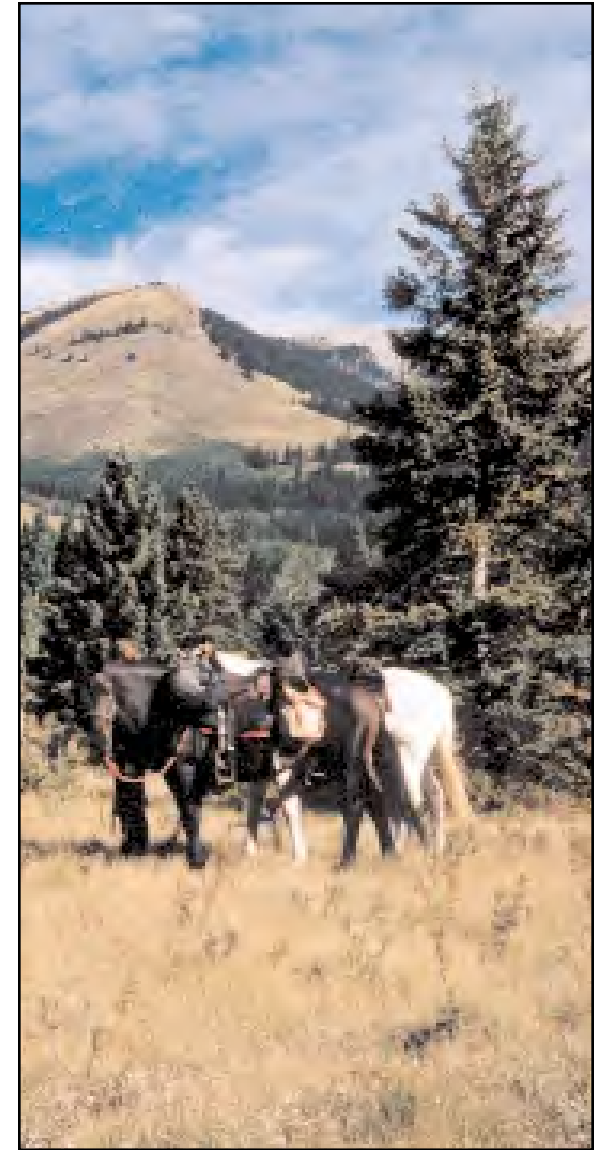
Southesk was the first European to approach the Bighorn by following the eastern boundaries of Jasper Park and the White Goat Wilderness. He crossed Job Pass, followed Coral Creek to its confluence with the Cline, and on September 18, 1859 reached the valley of the North Saskatchewan.

KOOTENAY PLAINS 1859

“We marched a few miles, in a southerly direction, up the course of the North Saskatchewan and halted at the Kootanie Plain. This so-called plain is merely an inconsiderable enlargement of the valley – a space of some fifty acres, bare of trees and covered with short prairie grasses” (Southesk 1875, 235).

Southesk arrived only two weeks after Hector, and though he knew about the coincidence (he came across one of Hector’s markers), Hector didn’t hear about it until the two men met in Scotland. It’s a wonder they knew they were discussing the same piece of country. The only thing they agreed on was the “bleak moor” on the upper Siffleur River. Where Hector saw poplars and pines, Southesk saw only grass. Their most startling difference, however, was in their recollection of the size of the Kootenay Plains.

In Hector’s view, the plains were “seven or eight miles long and two to three miles wide” – in other words, some 12,000 acres compared to Southesk’s 50. One possible reason for the latter’s view of the plains is that he really didn’t have one. He arrived at dusk, camped in the rain and left lamenting a heavy mist that obscured his view of the mountains.



Early exploration required skill at moving through mountainous areas on horseback, carrying gear and food on pack horses.



It is more often than not the elements that determine where people can live. Cabins like this one that stands today on the Kootenay Plains, reminding us of the adventure and hope that brought people to this region.

At the beginning of the twentieth century, an American turned up in the Bighorn Wildland. Born and raised in Philadelphia, Mary Schäffer didn't seem the type to tackle a rugged life on the trail. Both her parents were well-to-do, and by her own account, she'd enjoyed a pampered upbringing. She married a doctor whose hobby was botany, and though she accompanied him every summer to collect plants in the Rockies, they arrived by train, put up in a hotel and rarely strayed far from the railway. It was only after she was widowed that buckskins and chaps appeared in her otherwise fashionable wardrobe, and at 43, Mary Schäffer learned to ride, hired a guide and ventured into the wilderness.

Her travels took her into the Bighorn three years running. In 1905, she descended the trail through the Siffleur Wilderness to camp on the Kootenay Plains. That summer she was on a mission to complete her husband's alpine collection. The following summer she returned for a second visit, but in 1907, suddenly impatient with "short trips," she decided to explore the country that (apart from the Stoney families) was the exclusive province of men. The result was a pack trip through the Rockies that lasted the length of the summer.

At the end of a 25-mile ride from Pinto Lake – "stormswept, chilled, and baked by turns" – she reached the Kootenay Plains for the third and last time. As a rule, Mary Schäffer's writing was light and witty, but that fall, her mood took a somber turn. The trickle of Europeans that had left scarcely a trace on the plains was turning into a flood, and convinced that the era of "secret places" was coming to an end, she took up her pen to write a tribute to the beauty of the Kootenay Plains.

KOOTENAY PLAINS 1907

"To see the Plains at their best, one should come over the Pipestone trail in August, and look down on the scene from the rolling hills to the South. Then the golden-brown of the ripened grasses floods the valley with light, for miles the river winds and twists from west to east...the faint ringing of a bell denotes that a few tiny specks on the landscape are really horses, and the white dots are tepees of the Indians. Here the air is sweeter, dryer, and softer than anywhere I know, and here the world could easily be forgotten and life pass by in a dream" (Schäffer 1911, 70).

On her last evening on the plains, Mary Schäffer attended a dinner party in Eliot Barnes' cabin. The company included the party of travellers, a cluster of Stoney women, and once it grew dark, Silas Abraham and Samson Beaver. They were a merry lot, full of teasing and laughter, but as Samson Beaver crouched to light his pipe at the fire – face, braids and brass earrings lit up by the glow – once again her account was tinged with regret. "I was glad," she wrote, "for even this picture which in a few years can be no more."



Trail and survey markers, evidence of early travel through the area, were squared off from standing trees and can be found along trails in the Bighorn Wildland.

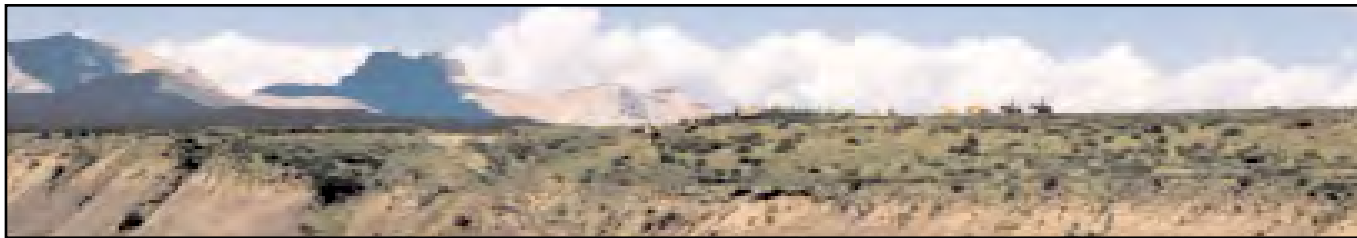
OUTFITTERS



17

VIVIAN PHARIS

OUTFITTERS



Who knows better the intricacies and intimacies of the Bighorn Wildland than those who work and live there? In the modern era, these are the guide-outfitters who often set up their camps in snow in May and remove them in the snow of late November.

Some of the Bighorn's guide-outfitters have worked in, known and admired the area for two and three generations.



Chester Sands (left) and his successful client show off a beautiful full-curl ram.

CHESTER SANDS AND HIS FAMILY

The Sands family's roots in the Bighorn Wildland are anchored into the mountain soils as firmly as are the roots of trees that hold tight at the edge of timberline in the teeth of the blasting wind. For 78 years, Chester Sands and his family have roamed these lands, guiding and outfitting in many parts of what has become known as the Bighorn Wildland.

The Sands family followed on the heels of the earliest outfitters and guides to operate in this territory. Both the notorious Tom Wilson and Jim Simpson of early mountain exploration and Banff National Park fame had interests in lands that are now part of the Bighorn and included parts of the area in their extended guiding operations. They barely preceded Chester's father, Clarence, in the Bighorn. Clarence began guiding and outfitting in 1919, around the same time that Tom Wilson gave up his attempts to gain ownership of the Kootenay Plains and moved to British Columbia. Clarence missed meeting Mary Schäffer by only 12 years.

On her last trip through the Kootenay Plains in 1907, Mary Schäffer wrote forebodingly of the impending flood of visitors into such secret wilderness places as Cataract Creek, the Cline River and the Kootenay Plains. Clarence was one of the first to lead expeditions of the tourists and hunters whom Mary Schäffer saw as those who would civilize and spoil the area. He led them throughout the mountainous terrain north of the North Saskatchewan River and along the Cline River to Pinto Lake before roads came anywhere near and before the river was dammed.

Clarence was an early explorer of the Blackstone, Wapiabi and Brazeau Rivers and of the rugged Job and Coral Creeks. He continued to escort adventurers into these areas, helping them to find what were often record-book trophy bighorn sheep and elk, until he passed into a whole new territory in 1952. The vast knowledge that Clarence accumulated over more than 30 years of the land and its wildlife, and the rivers, trails and weather was passed on to his sons, Chester and Sam, and to their sister, Myrtle Ravio. All three offspring followed their father into the Bighorn and made their livelihoods, at least in part, from this spectacular and bountiful place.

Myrtle's guiding area included the Blackstone, Job and Coral Creeks, while Sam began his guiding career in the Blackstone but moved operations into Whiterabbit Creek and the North Ram River. Sam's son Don carried on the family tradition for several years in the South Ram River before selling his non-resident ram permits about 20 years ago to Lorne Hindbo, who has ably continued summer trail riding operations in the North Ram and fall hunting operations in the South Ram ever since. Chester took over the Cline–Job–Coral area from his father in 1954, after six years of apprenticing with him and several additional years of working for another outfitter.

In early days, before the North Forestry Road and Highway 11 had been cut through, Chester's family trailed their pack strings from their ranch on the Sunchild Road west of Rocky Mountain House, about 200 km into their fall hunting grounds in the Bighorn. They were assisted then by what Chester claims to be a lost breed of horse, the Cayuse. Cayuse horses were preferred for working in this difficult terrain of heavy deadfall, muskeg and steep, rocky slopes. They were not pretty horses, but their

heavy bone structure allowed them to carry large loads and their broad feet kept them on the tops of muskegs. Once broken, Cayuse horses were unflappable, strong and steady – ideally suited for early expeditions into the rough country in and around the Bighorn Wildland.

Over the years, most of Chester’s hunting clients came from the United States, and many returned for trips with him. Return clients especially admired the wild, scenic and challenging country they found in places like Job and Coral Creeks and along the Blackstone and Brazeau Rivers. One particular client returned 17 times. Chester is proud that under his guidance one American doctor made three “grand slams,” or hunted three sets of trophies from all four North American species of horned sheep, completing each with a bighorn.

Chester regrets that in his 51 years of working and guiding in the Bighorn, his clients only ever took two record-book trophy rams from the area. It is Chester’s view that many years of selective hunting for the best trophy rams altered the local gene pool so that small-horned animals now dominate. However, Chester’s observation is that bighorn sheep numbers are about the same today as they were 50 years ago. The same is not true for the elk population, which he observes to be greatly reduced from what it was in the 1960s. Although a massive predator poisoning campaign in 1951 and 1952 allowed the elk population to swell, Chester suggests that fire control may have influenced the subsequent collapse by reducing forage availability. He feels that the Bighorn’s grizzly bears are currently at a historically high



Chester Sands and his able pack string not only carried hunters, fishermen and tourists into the backcountry; they also accommodated geological expeditions into the Bighorn and adjacent national park lands in the 1950s and 1960s.



Semi-permanent outfitter camps are sometimes set up in May and removed in November. A bear-safe cache stands on the right in this Panther Corners camp.



Packing horses is an intricate and vanishing skill. Each packer uses variations on a theme. In this case the red panniers (or pack boxes) hang from the packsaddle tree by permanent pannier ropes. The top pack is held in place by a rope cinched down to the panniers. Over all of this goes a protective tarpaulin, and then a version of the diamond hitch knot will hold everything securely until the next camp is reached.

population level and that the mountain goat population is holding its own or slowly increasing. Mountain caribou, though, while never plentiful in the area, have dwindled to a very few animals whose tracks are only occasionally seen today in places like the Siffleur, Cline, Job and Coral valleys.

Not all of Chester's guiding and outfitting involved hunters. Prior to the filling of Abraham Reservoir in 1978, Chester ran six-day summer trail rides into Pinto Lake, where fishing for the lake's renowned salmon-like bull trout must have fulfilled many fishermen's dreams. Chester also used his expertise and string of packhorses to expedite geological surveys in the Bighorn and into neighbouring national park lands, where companies like Shell Canada mapped outcropping rock formations.

Chester has witnessed vast changes to the countryside east of the Bighorn over the past three-quarters of a century, yet he finds it remarkable that a few remote parts of the Bighorn, like the Job-Coral area, have remained virtually unchanged. There are more people in the backcountry than there used to be, but Chester concedes that today's hunters and wilderness seekers expect to find a bit of company and are not put off by it. He admits that while horse and foot travel does some damage to the environment, the force of a single major flood and the effects of industry and motorized travel cause far greater and more lasting damage. He is perhaps a bit wistful that his son will not follow his father and grandfather into the Bighorn as a guide. Chester did not encourage his son because he thought the Bighorn would fall to development just as the lands to the east have done, and be lost to a twenty-first-century generation of guides and outfitters.

EARLY FOREST RANGERS

by R. E. Stevenson

The Bighorn Wildland is part of the larger Rocky Mountain Forest Reserve established in 1906 by the federal government to protect the Eastern Slopes of Alberta as forested watershed. Since then, the lands of the Bighorn have primarily been the responsibility of the Alberta Forest Service. In 1910 forestry staff established permanent offices in Calgary and Edmonton. Rangers, many of them temporary for the fire season, began to build a network of horse and wagon trails to their remote log cabin stations and fire lookouts throughout the forest reserve. Their primary responsibility was the protection of forests from fire and the regulation of logging to ensure water supplies vital to new settlements and agriculture on the prairies.

Initially, foresters and rangers followed existing First Nations paths and outfitter trails as they mapped and took inventory of Eastern Slopes forests, water and wildlife. Ranger cabins and forest fire caches were soon located at strategic points throughout the foothills and mountains. Most cabins were spaced about one day's horseback ride apart. Some of these old buildings are evident today, such as the Headwaters cabin on the South Ram River, built in 1912. Although the Vimy cabin, on a tributary of the Wapiabi River, has been replaced, the new cabin is a fine example of the sort of log cabin craftsmanship often found in early cabin construction.

As the pattern of stations became established, rangers spent much of their time maintaining trails and telephone lines that connected their cabins to various lookouts and headquarters. In the foothills, the rangers laid out logging areas for a growing number of portable sawmills supplying timber for new and expanding settlements, railroads and coal mines. Rangers also served as game guardians and were the main government contact for trappers, outfitters and early recreationists in places like the Bighorn. A close liaison between forest rangers and national park wardens allowed a "shared watch" for fire and poaching activities along park boundaries. Many of the early rangers and park wardens were colourful characters who took great pride in their work and their territories, and they were the voice of authority over large areas, like the lands of the Bighorn.



Campfire cooking at day's end is especially fine when a bounty of fresh mushrooms is on the menu.



The historic Headwaters patrol cabin in 1928. It still stands on a bluff overlooking the South Ram near the trail junction to Whiterabbit Creek.

MILDRED MCKENZIE AND HER FAMILY

As a young man in the early 1940s, Ed McKenzie, Mildred McKenzie's husband, took up the challenging work of backcountry guiding in the foothills and mountains west of Rocky Mountain House. At first Ed worked for established outfitters like Ken Thompson and the Sands family. He gained his own guide's license in 1948 and worked for Ken Thompson through the early 1950s, helping to outfit and facilitate large geological expeditions that were mapping landscapes and outcrops west of Rocky Mountain House.

Ed grew up at Stauffer, just east of Rocky Mountain House, in a family steeped in the culture of the outdoors, hunting and horses. His father freighted goods by horse and wagon as far west as the booming coal-mining town of Nordegg. In the fall, the extended McKenzie family would load up their wagons and travel west into good hunting territory in order to lay in the winter's supply of meat. Young Ed learned from his earliest days how to handle horses and guns and to find his way through rugged terrain.

A bright and lively girl from Crossfield caught Ed's eye, and he and Mildred married in 1954. That year the newlyweds made an epic fall hunting trip, riding from Stauffer to the Blackstone River, following a combination of truck trails, horse trails and game trails. Mildred got a sudden and thorough introduction to life on the trail as the working partner of a guide and outfitter. The life obviously suited her, as she was still out on the trail and acting as camp cook for her son Ron in the year 2000, six years after Ed's sudden and unexpected death.

In 1954 a road was extended west of Nordegg as far as Whirlpool Point – part of a continuing attempt by area business interests to develop a trading route across the Howse Pass in Banff National Park. This road allowed horses and gear to be trucked much closer to take-off points into what is now the Bighorn Wildland. By 1957 the road was carved further along the west shore of the North Saskatchewan River to the Cline River/Coral Creek junction. That year the McKenzies were employed to work in the valley of Coral Creek by outfitter and guide Myrtle Ravio (nee Sands). It was a year of heavy rains and when the McKenzies came down the valley for more supplies, they found that the new road was extensively washed out. They left their hobbled pack and saddle horses to graze on the Kootenay Plains and continued to Nordegg by vehicle. Mildred recalls that it took them eight hours to drive from Coral Creek to Nordegg – far longer than it had taken them to ride about 20 km down the dangerously flooded Coral Creek.

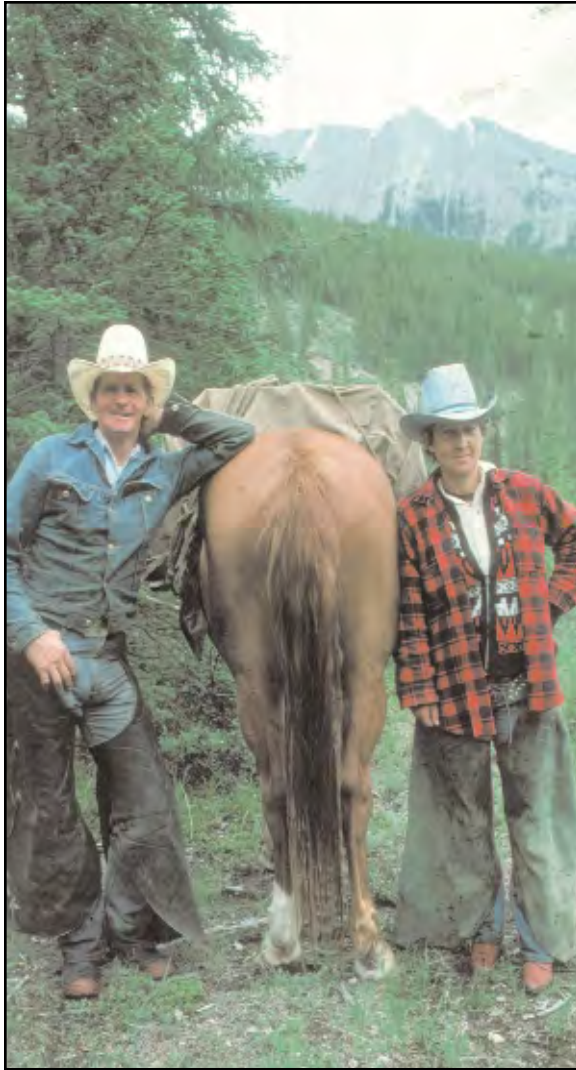
Ed and Mildred got into their own outfitting and guiding business by chance when a business deal with another outfitter fell through and the McKenzies felt obliged to accommodate hunters who had booked trips in the fall of 1966. They borrowed gear and some horses and began operations. The next year tragedy struck their fledgling company when a forest fire burned their ranch buildings and they lost newly acquired saddles and other equipment.

Undaunted, the McKenzies began again and soon established a base camp at the junction of Coral Creek and the North Saskatchewan River. McKenzie's Trails West was born, and regular trail rides were in operation from the site by 1972. The company and base camp continue to exist as

testament to the drive and spirit of Ed and Mildred. Now operated by son Ron, McKenzie's Trails West has served thousands of clients over the years with day-long or extended backcountry trips into some of the most spectacular country along Alberta's Eastern Slopes. Other camps were established at the top of Coral Creek and at Job (or Blue) Lake. Clients on extended trips were often taken over the rugged trail up Coral Creek to stay at Hearts and Diamonds camp before crossing the breathtaking Job Pass and riding on to camp at picture-perfect Blue Lake.

For many years Alberta's Fish and Wildlife Agency operated Job Lake as a reservoir of pure cutthroat trout eggs. But in the early 1970s the lake was opened to sport fishing, and it soon became an angler's mecca. The fish were large and plentiful, and had especially tasty, deep pink flesh. Not only was the fishing superb, but so was the scenery. This combination proved unfortunate, as so many visitors descended on the area that there were sometimes as many as 200 horses grazing around the lake's shores. Steep Job Pass suffered severe erosion, as did the lake's shores. Finally, the added pressure of helicopter fishing in the mid-1980s brought the fishery to near collapse and forced official action. Horses were banned around the lake in 1986 and the lake was closed to fishing in 1989. Now, more than a decade later, the lake's shore is still in a state of recovery and fishing has not been reinstated. The McKenzies moved their Blue Lake camp about seven km to the junction of Wilson (or Blue) Creek and Job Creek, and clients continued to access the lake on day rides.

Guiding hunters was the primary part of the McKenzies' operations before a government decision in the 1980s limited the all-important non-resident permits for bighorn sheep and elk in



On a typical day on the trail, Mildred and Ed McKenzie rest against a horse they have just packed.

order to encourage more outfitters into the business. When the non-resident permit numbers were decided by bid, the McKenzies acquired four bighorn sheep and two elk permits. Today Ron McKenzie continues to outfit and guide clients into the Job Creek valley and its tributaries in search of trophies. In earlier years, grizzly hunting would open in May and the McKenzies would set up spring camps in the snow and sometimes end them in blizzards at the end of November. Removing camps often involved extreme endurance, if the streams were freezing over, the snows were deep and the ropes, hobbles and pack equipment were coated in ice.

In addition to guiding, trail riding has been an integral part of their operations ever since Ed and Mildred established McKenzie's Trails West. Extended trips may take clients up the spectacular Coral Creek valley and over into Job Creek and Job Lake, or they may begin at Terishshner Creek or Crescent Falls on the Bighorn River and travel over the historic Bighorn Trail to the Blackstone River, and from there up the Brazeau River to Job Creek and Job Lake. The pattern of travel is usually one day of riding with the pack string between camps, followed by a day at camp and possibly some day riding.

Mildred's roles in the family outfitting business included trip organizer, goods purchaser and chief camp cook. She often had her role extended to being nurse, consoler and camp confessor when clients felt out-of-sorts. A rainy day meant that Mildred also had to become entertainer for camp-bound clients. She did all these jobs as well as raise a family of nine children on the family ranch,

where she still lives. When the children were very young, the company often hired cooks to work in the backcountry, but Mildred would still be in charge of trip organization. When she and Ed were at the peak of their business, summers and falls were often a blur of backcountry trips alternated with trips back home to shop, pack horse panniers and organize the next trip. That all of the children were able to participate in the family business and see and experience a remnant of Alberta's wild frontier is a great consolation to Mildred.

For years, Mildred and Ed were involved in the Alberta Outfitters Association and were members of the executive. Privately and through the association, they both strove for the protection of the Bighorn Wildland. Over the years the two wrote dozens of letters to government officials and attended dozens of meetings to try to gain protection for the beautiful valleys and mountains that they loved so much and that sustained them in their business. Mildred expresses disbelief that there is now no obvious official interest in protecting this most wild and spectacular part of the province – a part that has contributed so much to tourism and could continue to attract tourists who want to see wild and scenic places. Mildred is convinced that people suffering the stresses of today's fast-paced life need places of solitude and beauty like the Bighorn Wildland, where they can escape for a while and become refreshed.

In Ed's memory, the McKenzie family has officially adopted the maintenance of the Coral Creek trail, under the local Forest Service's Adopt-a-Trail program.



A patient pack pony is entrusted with an awkward load, the head and rack of a bull moose, to carefully maneuver out of a rough piece of country.

THE VALUE OF WILD PLACES



18

PHILIP CLEMENT & ALAN ERNST

THE VALUE OF WILD PLACES

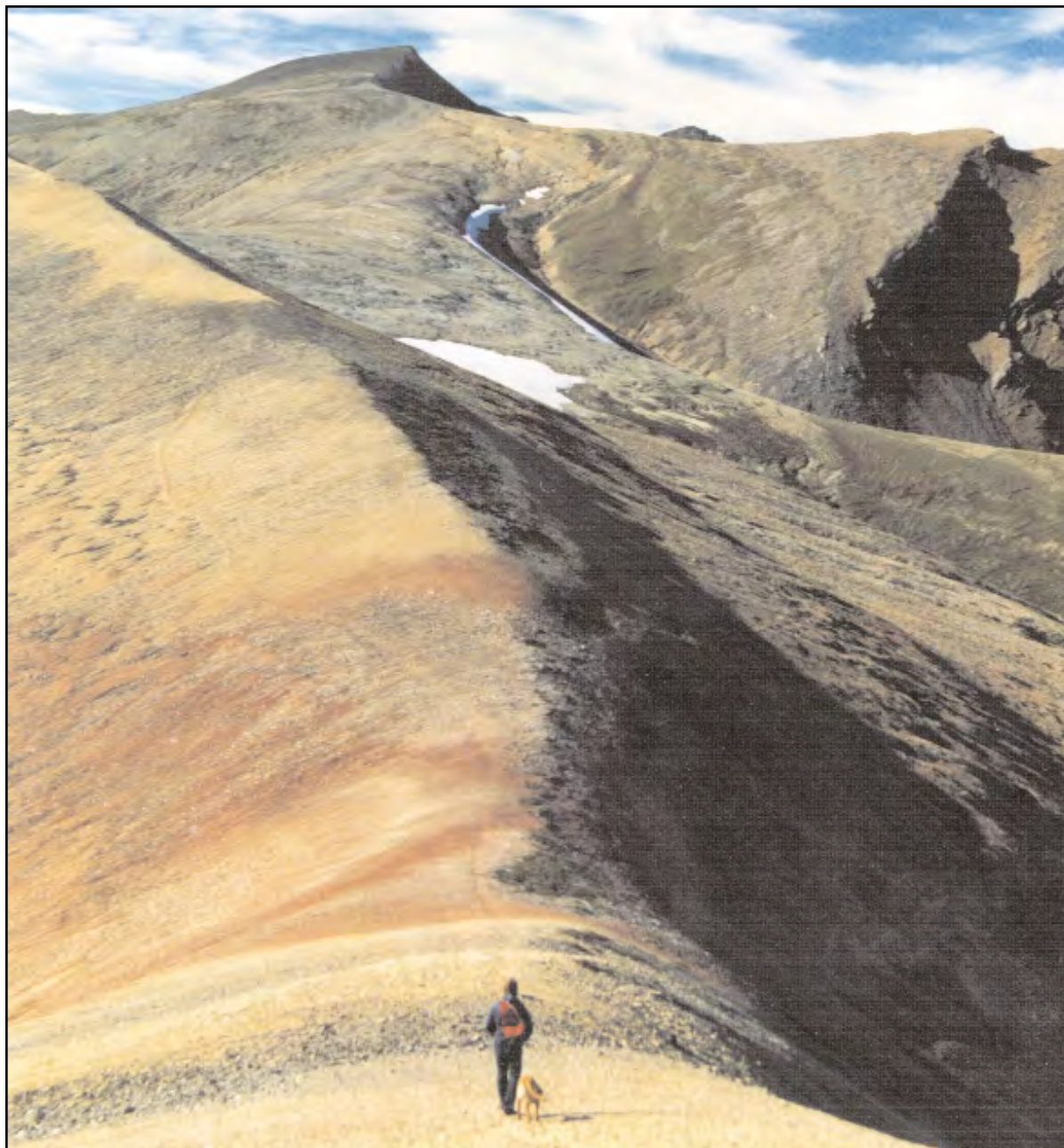


Large and intact wilderness areas, especially those as aesthetically pleasing and accessible as the Bighorn Wildland, have become rare and valuable commodities in our increasingly developed world.

A host of truly sustainable economic values can be realized from unimpaired ecosystems.

These values run the gamut from basic ecosystem services such as water purification to entrepreneurial ecotourism ventures.

The unspoiled landscapes of the Bighorn, if managed for ecosystem protection, will provide diverse economic returns into the distant future. Such management will require public endorsement, political will and science-based decision making.



ECONOMY AND ECOLOGY

The root of both *economy* and *ecology* comes from the Greek *oikos* meaning “house.” Conceptually, our *oikos* comprises our total environment, including air, land, water and natural resources. However, economics has become more narrowly defined and is now centered on cash value. To most people, our economy is based on the stock market, consumerism, corporations and resource industries. Because all of these ultimately depend on natural resources, however, good economics must include sound environmental management and must protect the resources on which it depends. Recent economic analyses have calculated monetary values for such intangible resources as recreation, aesthetics and soil formation. It is now possible to assess, for example, the potential wealth that might be created through resource extraction, compared to the existing wealth that would be maintained by protecting the landscape.

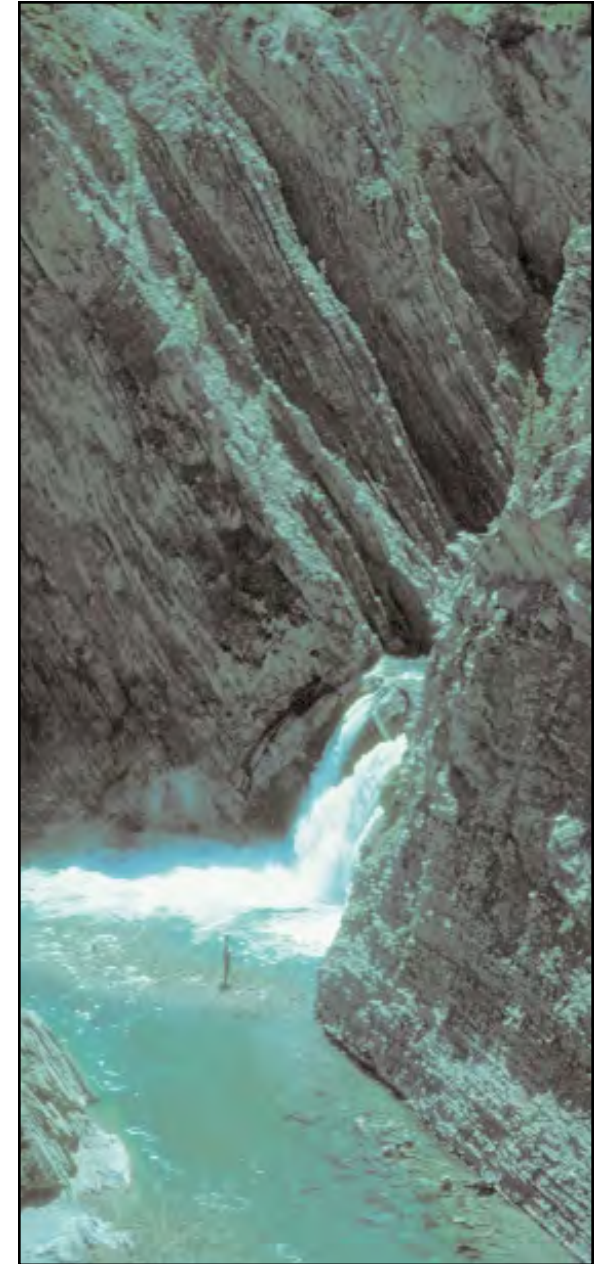
Wild lands like this divide between Coral and Job Creeks offer countless benefits including aesthetic recreation, water production, wildlife habitat, air cleansing and climatic stability.

THE VALUE OF WILD PLACES

Wild areas offer countless benefits to Albertans. Natural areas provide essential life-support functions that have not traditionally been considered as part of the economic spectrum. Increasingly, however, we are recognizing that these support systems are both precarious and tremendously valuable. Nature provides us with an adequate supply of clean water and air, stabilizes local climates, builds soil, cycles nutrients required for food production, provides habitat for wildlife and maintains biodiversity. The Bighorn Wildland, for example, provides vital watershed services. Much of the water in the North Saskatchewan and Red Deer River systems is gathered and naturally purified in the Bighorn. Together, these two rivers supply clean drinking water for approximately two million downstream users in places like Edmonton, Red Deer and Saskatoon.

Economists have demonstrated that communities adjacent to large protected wilderness areas have become prosperous multi-business communities because people are attracted by the high quality of life in the region. These people bring expertise, jobs, business skills and wealth to the region. By contrast, extractive resource-based economies follow a boom-and-bust cycle and lack a sustainable economic basis. The communities of Sundre, Caroline, Rocky Mountain House and Nordegg are ideally situated to reap the long-term benefits of the Bighorn, if it is appropriately protected.

Albertans enjoy wilderness for its recreational, cultural and aesthetic values. We go to wild places to relax and refresh our minds and bodies. We turn to wilderness for adventure, inspiration and spiritual renewal. We hike, ski, take photographs, watch birds and study wildlife. We collect wild berries, fish and hunt. To enjoy these pleasures, we spend a great deal of money on facilities, equipment and expertise. In fact, Albertans spent \$1.2 billion on nature-based activities in 1996, contributing over \$1.5 billion to the gross domestic product and supporting 23,600 jobs in the province. This kind of economic activity will be sustained only if tourism and recreational activities are appropriately managed. Ecosystem-based tourism management has become a viable alternative to extractive economies worldwide.



What value would this fisherman attribute to his experience at this splendid location on the Ram River?



Outdoor programs are offered year round by local operators. The opportunities for even the most extreme enthusiast are endless.

ECOTOURISM

Although the term *ecotourism* has been a part of our lexicon for only a short time, it is already so broadly applied that many people have become sceptical of its meaning. Responsible groups like the International Ecotourism Society (IES) are trying to rescue ecotourism's integrity by narrowing its definition and standardizing its application. The IES defines ecotourism as "responsible travel to natural areas, which conserves the environment and improves the welfare of local people."

The Bighorn has been used for a variety of economic, spiritual, recreational and tourism purposes for generations. These activities have relied on the wilderness character of the area to provide employment and income to local residents for more than a hundred years. Guiding and outfitting for hunters, anglers, mountaineers, geological surveyors, photographers and tourists has a long and respected history in the area. Before the petroleum industry brought boom conditions to towns like Sundre and Rocky Mountain House, guided hunting was among the region's most important businesses.

The Bighorn still supports approximately 30 guiding and outfitting businesses, as well as others that occasionally operate in the area. Outfitting and ecotourism businesses are locally owned and operated, and the bulk of income circulates through the local community. By contrast, foreign-owned forestry and petroleum companies direct most of their profits outside Alberta. A 1996 Alberta government study found that the economic potential of protected landscapes is comparable to that of the forestry and agriculture industries and can provide as many jobs as resource

extraction industries, without the environmental damage associated with these industries.

Tourists come to Alberta to visit the spectacular wilderness of our mountain parks. Demand for nature-based, low-impact, educational travel has been growing at rates of 10 to 15 per cent annually, worldwide. For some countries like Costa Rica, ecotourism has become the single most important industry. The value of wilderness is increasing, as is the need to protect what is left. Alberta, however, has protected a relatively small proportion of its land base. The provincial government has protected only 4.5 per cent of Alberta; far more land is dedicated to extractive resource industries. A recent federal government survey demonstrated that about three million people in North America alone are interested in nature-based tourism in Alberta and British Columbia. Until the Alberta government recognizes the need to protect places like the Bighorn Wildland, the growing demand for wilderness-based tourism will not be met in this province.

Surrounded on three sides by national parks, the Bighorn Wildland has escaped high-impact tourism development and is uniquely positioned to become an ecotourism mecca. While Banff, Jasper and the Bow Valley are heavily developed and commercialized, the Bighorn is characterized by small-scale, ecologically sensitive developments that emphasize unobtrusive wilderness enjoyment.

A large majority of visitors to the area favour low-impact development that will preserve the pristine wilderness character of the region. The local government has identified two areas of the Bighorn (along Highway 11) as development nodes, where suitable ecotourism ventures will flourish. If they are to remain compatible with the

area, appropriate ecosystem-based management requirements must be developed for these nodes.

The area proposed for protection as the Bighorn Wildland is 4000 sq km, or just about half the size of the adjacent forest management area allocated to Sunpine Forest Products Ltd., a medium-sized forestry company that employs approximately 1100 people. A comparable number of people could be employed in ecotourism in and adjacent to the Bighorn Wildland, with greater job variety and fewer government subsidies, and resulting in far less ecological damage.

The Bighorn Wildland is an international treasure because of its beauty, size and biological diversity. It is important to Albertans as a source of water and long-term economic opportunities. Protecting large wilderness areas such as this one makes good economic sense. With appropriate protection and management strategies, places like the Bighorn can be maintained in a wilderness state and contribute to our economic well-being in perpetuity.



For these two hikers, the superb views and totally wild and free landscapes along Whiterabbit Creek are beyond monetary value.



Winter solitude is broken only by the crunch of boots in the crisp snow as this adventurer enjoys the beautiful scenery offered in the Bighorn Wildland.

WILDERNESS ETHICS FOR BACKPACKING AND RIVER TRAVEL

by Don Wales

The evolution of backcountry travel ethics has accelerated over the last decade. In heavily used wilderness areas in North America, serious efforts are made by recreationists to reduce wear on trails by wearing low-tread hiking boots, to protect the vegetation at campsites with no fire policies and to pack out garbage and human waste.

Backcountry random camping is a privilege treasured by adventuresome backpackers. Campsites need to be located well away from creeks and lakes and for river travellers, at least 30 metres from shore lines, and established on bare ground, if possible. To reduce the trampling of vegetation around the sites, don't stay more than two nights at any one site. Gas backpacking stoves are better than fires unless there is an emergency requiring drying or warmth. There are literally hundreds of old outfitter camps throughout the Eastern Slopes that have established firepits, but if fires are required, they must be kept small to minimize the impact that comes from harvesting dry branches and deadfall.

If fires must be built, choose a rock or mineral base if possible. If not, remove ground cover in

sods, dig down to mineral soil and ring the pit with rocks. When finished remove the stones and unburnt wood, replace rocks and water the site.

All garbage, including biodegradable material, must be packed out. This includes the foil liners of backpacking food packages that don't get consumed in a fire. Dishes must be washed in biodegradable soap and the wash water dumped well away from any body of water. Never wash dishes in rivers or lakes. Human wastes should be buried in soil that likely contains the bacteria and fungi necessary for decomposition of the wastes. The soil in the high alpine does not necessarily contain the appropriate bacteria, and in these areas waste should be deposited between the boulders of a rockslide or talus slope, where they dry out and become part of the humus.

In Alberta's Eastern Slopes, every effort should be made to reduce our impact on our precious wilderness resources. When walking, staying on existing trails no matter how muddy they get helps prevent braiding of trails. The ultimate goal of every backcountry traveller is to do whatever it takes to "travel without a trace."



We go to wilderness to refresh our minds and challenge our bodies, to experience adventure and to gain inspiration and spiritual renewal.

GLOSSARY OF GEOLOGICAL TERMS

BITUMINOUS COAL

Coal describes rocks made up of carbon-rich material derived from former living plants and altered by burial (heat and pressure) over time. The general sequence of coal formation is peat, lignite, bituminous coal and anthracite; thus bituminous coal is an intermediate step in coalification.

CANADIAN SHIELD

The large mass of igneous and metamorphic rocks of Precambrian age seen on the surface of the North American continent. These rocks continue as basement below the surrounding Phanerozoic sedimentary basins including the Western Canada Sedimentary Basin.

CARBONATE ROCKS OR CARBONATES

Sedimentary rocks made up of the minerals calcite (calcium carbonate, or limestone) and/or dolomite (calcium and magnesium carbonate).

CLASTIC WEDGE

The thickness of sedimentary rocks, mostly sandstones, siltstones and shales, eroded from rising mountain ranges that developed along the tectonically active western edge of North America from mid-Mesozoic to early Cenozoic time.

CORDILLERAN MOUNTAIN BELT

The major series of mountains that occurs on the tectonically active western edge of North, Central and South America, and represents the interaction of tectonic plates of the Pacific Ocean with those of the North and South American continents over many millions of years.

CRUSTAL SHORTENING

The process by which rock masses have been compressed by telescoping along thrust faults and by folding.

DIP

The angle between a horizontal plane and a surface such as a bedding plane or fault.

FAULT

A fracture in rock with some relative movement of rock masses on either side. Thrust faults or thrusts are surfaces, usually slightly to steeply inclined, along which rocks have been displaced such that older rocks overlie younger rocks. Normal faults occur where rocks on one side of a fault have been lowered compared to rocks on the other side of the fault.

FOLD

A geological feature in which a rock mass has been bent or flexed into rounded shapes. The two most common kinds of folds are anticlines, which in cross-section look something like upside down U's or V's, and synclines, which in cross-section look like right side up U's or V's.

FOOTHILLS GEOLOGICAL PROVINCE

In Alberta, the region of low, rounded hills bounded on the east by the Interior Plains and on the west by the Front Ranges.

FORMATION

The basic unit for naming an assemblage of rocks. A formation normally represents a similar depositional environment, can be shown on a geological map and may be traceable into the subsurface.

FRONT RANGES GEOLOGICAL PROVINCE

In Alberta, the northwesterly trending, high-relief ranges of the Rocky Mountains bounded by the Main Ranges to the west and the Foothills to the east.

GEOLOGICAL MAP

A special type of map that shows the kinds and distribution of geological material – normally rocks or sand, gravel and so on – that occurs at the surface. Geological maps also show structural features such as faults and folds. When you look at a geological map, it is as if you are suspended up in the air, looking straight down at what you see on the surface.

IGNEOUS ROCK

Rock that has solidified or hardened upon cooling from a molten mass known as a magma.

KIMBERLITE

A type of igneous rock that has come from deep within the Earth to the surface and may carry diamonds that grew under conditions of very high temperature and pressure.

MAIN RANGES GEOLOGICAL PROVINCE

In Alberta and B.C., the northwesterly trending mountain ranges that extend from the Continental Divide on the west side to the Front Ranges on the east side.

MASTER FAULT OR SOLE FAULT

A major thrust fault normally found at depth below the surface and consisting of a collection of several to many thrust faults joining at depth to form one continuous fault, the master fault.

METAMORPHIC ROCK

Rock formed without melting from a pre-existing rock in response to major changes in temperature and pressure, normally well below the Earth's surface.

MOUNTAIN BUILDING

The collection of geological processes, normally part of or related to plate tectonic interactions, by which new mountains are formed.

PLATE TECTONICS

The interactions of the approximately 16 rigid interlocking rock masses of the earth's crust called plates. Plates are created at mid-ocean ridges, zones of crustal production, and are consumed at subduction zones such as those found today off the west coasts of North, Central and South America.

PLATFORM WEDGE

The thickness of sedimentary rocks that was deposited on or beside the tectonically inactive western edge of the North American continent from Late Proterozoic to mid-Mesozoic time.

SANDSTONE

A sedimentary rock made up of particles, most commonly the mineral quartz, between 2 and 1/16 mm in diameter.

SEISMIC STUDIES

Studies carried out by earth scientists to determine the kinds and structural nature of rocks below the surface. Energy from explosives or from large vibrating hammers is sent into the ground at one or more points, and the energy that is reflected back to the surface from rocks at depth is recorded on a number of instruments widely spaced away from the explosive or hammer source.

SHALE

A fine-grained sedimentary rock formed from the cementation of clay and silt.

SILTSTONE

A sedimentary rock made up of particles between 1/16 and 1/256 mm in diameter.

STRUCTURAL TRAPS

Subsurface geological features in which oil and/or natural gas may have accumulated by being trapped within anticlines or fault-bounded structures. A successful structural trap has porosity and permeability (holes that are connected) in the reservoir rocks, and some kind of seal – for example, a shale unit that oil and gas can't pass through.

STRUCTURE OR GEOLOGICAL STRUCTURE

The geometry of rocks – their surfaces, planes, lines, and contacts with other rocks. Geometry involves describing and classifying; another important part of geological structure is the study of the origin of geological structures.

U-SHAPED VALLEY

A valley with steep upper walls that grade downward into a flat, wide valley floor; such valleys are usually eroded/excavated by ice.

WESTERN CANADA SEDIMENTARY BASIN

The thickness of sedimentary rocks that was deposited on the igneous and metamorphic basement rocks of the Canadian Shield and underlies Alberta, Saskatchewan and Manitoba.

KEY REFERENCES

CHAPTER 2

Alberta Energy and Natural Resources. n.d. Forest Land Use Zones. Edmonton, AB: Alberta Energy and Natural Resources.

Alberta Energy and Natural Resources. 1977. A policy for resource management of the Eastern Slopes. Edmonton, AB: Alberta Energy and Natural Resources.

Alberta Energy and Natural Resources. 1984. A policy for resource management of the Eastern Slopes. Revised 1984. Edmonton, AB: Alberta Energy and Natural Resources.

Alberta Environment. 1975. Policy statement: The development of the Eastern Slopes. Edmonton, AB: Alberta Environment.

Alberta Environment Conservation Authority. 1974. Land use and resource development in the Eastern Slopes: Report and recommendations. Edmonton, AB: Alberta Environment Conservation Authority.

Alberta Forestry. 1986. Nordegg–Red Deer River Sub-Regional Integrated Resource Plan. Edmonton, AB: Alberta Energy and Natural Resources.

Alberta Forestry, Lands and Wildlife. n.d. Protected areas in Alberta's mountain forests. Edmonton, AB: Alberta Forestry, Lands and Wildlife Forest Service.

Alberta Forestry, Lands and Wildlife. 1987. Alberta's Bighorn Wildland Recreation Area. Edmonton, AB: Alberta Forestry, Lands and Wildlife.

Alberta Snowmobile Association. 2001. 2001/2002 Alberta guide to snowmobiling. Edmonton, AB: Alberta Snowmobile Association.

Alberta Sustainable Resource Development. 2002. The Forest Land Use Zones of the Bighorn Backcountry. Edmonton, AB: Alberta Sustainable Resource Development.

Bentz, J. A., A. Saxena, and T. T. Normand. 1995. Environmentally significant areas inventory: Foothills natural region, Alberta. Prepared by Geowest Environmental Consultants Ltd. for Alberta Environmental Protection.

Dobson, S., and J. Thompson. 1996. Parks and protected areas: Their contribution to the Alberta economy. Edmonton, AB: Alberta Environmental Protection.

Forman, R. T. T., D. S. Friedman, D. Fitzhenry, J. D. Martin, A. S. Chen, and L. E. Alexander. 1997. Ecological effects of roads. In *Habitat fragmentation and infrastructure*, edited by K. Canters, 40-54. Delft, Netherlands: Ministry of Transport, Public Works and Water Management.

Government of Alberta. 1986. Press release: Nordegg–Red Deer River Integrated Resource Plan approved: Bighorn Wildland Recreation Area announced. Edmonton, AB: Government of Alberta.

Jalkotzy, M. G., P. I. Ross, and M. D. Nasserden. 1997. *The effects of linear developments on wildlife: A review of selected scientific literature*. Calgary, AB: Arc Wildlife Services.

Sierra Club. 2001. Off-road use of motorized vehicles. Sierra Club Conservation Policies. Accessed December 4, 2001 from <http://www.sierraclub.org/policy/conservation/offroad.asp>.

Soule, M. E., and J. Terborgh (eds.). 1999. *Continental conservation*. Washington, D.C.: Island Press.

Sparrow, D. Letter to V. Pharis, AWA Director, October 26, 1992.

Sweetgrass Consultants Ltd. 1997. Environmentally significant areas of Alberta. Prepared for Alberta Environmental Protection.

Timoney, K. 1998. Environmentally significant areas inventory of the Rocky Mountain natural region of Alberta. Prepared by Treeline Ecological Research for Alberta Environmental Protection.

CHAPTERS 3 TO 11

Alberta Energy and Natural Resources. 1981. Ecological land classification for Red Deer–James and Ram–Clearwater. Edmonton, AB: Alberta Energy and Natural Resources.

Alberta Forest Service. 1973. Foothills resource allocation studies for Red Deer Drainage District; Clearwater Drainage District; Ram Drainage District; Upper Brazeau Drainage District; Cline–Siffleur Drainage District; North Saskatchewan Drainage District. Edmonton, AB: Alberta Forest Service.

Alberta Forestry, Lands and Wildlife. 1986. Rocky–North Saskatchewan Sub-Regional Integrated Resource Plan. Edmonton, AB: Alberta Forestry, Lands and Wildlife.

Kolar, B., and A. Brawn (eds.). 1986. *Eastern Slopes wildlands: Our living heritage*. Calgary, AB: Alberta Wilderness Association.

Chinnappa, C. C., and B. Hallworth. 1997. *Plants of Kananaskis Country*. Calgary, AB: University of Calgary Press.

Gadd, B. 1986. *Handbook of the Canadian Rockies*. Jasper, AB: Corax Press.

Hart, E. J. 1979. *Diamond hitch*. Banff, AB: Summerthought Ltd.

McCart, J., and P. McCart. 2000. *On the road with David Thompson*. Calgary, AB: Fifth House Ltd.

Morgantini, L. 1995. *The Ya Ha Tinda: An ecological overview*. Ottawa: Parks Canada.

CHAPTER 12

Hamilton, W. N., M. C. Price, and C. W. Langenberg (compilers). 1999. Geological map of Alberta: Alberta Geological Survey, Alberta Energy and Utilities Board, Map No. 236, scale 1:1,000,000.

Jones, P. B. 1988. *Structural geology of the Alberta Foothills Front in the Calgary region: Field trip guidebook*. Calgary, AB: Prepared for the Canadian Society of Petroleum Geologists, 32p.

Jones, P. B., and R. H. Workum. 1978. *Geological guide to the Central Foothills and Rocky Mountains of Alberta*. Calgary, AB: Canadian Society of Petroleum Geologists, 61p.

Kolar, B., and A. Brawn (eds.). 1986. *Eastern Slopes wildlands: Our living heritage*. Calgary, AB: Alberta Wilderness Association, 119p.

Mussieux, R., and M. Nelson. 1998. *A traveller's guide to geological wonders in Alberta*. Calgary, AB: Federation of Alberta Naturalists and Canadian Society of Petroleum Geologists, 254p.

Smith, G. G. 1989. Coal resources of Canada: Geological survey of Canada, Paper 89-4, 146p.

CHAPTER 13

Kershaw, L., J. Gould, D. Johnson, and J. Lancaster. 2001. *Rare vascular plants of Alberta*. Edmonton, AB: Alberta Native Plant Council and University of Alberta Press.

Moss, E. H. 1983. *Flora of Alberta*. 2d ed. Revised by J. G. Packer. Toronto: University of Toronto Press.

Scotter, G. W., and H. Flygare. 1986. *Wildflowers of the Canadian Rockies*. Edmonton, AB: Hurtig Publishers Ltd.

CHAPTER 14

Allen, J. H. Personal communication, 2002.

Allan, J. H. 1980. Life history notes on the Dolly Varden Char (*Salvelinus malma*) in the Upper Clearwater River, Alberta. Edmonton, AB: Alberta Energy and Natural Resources, Fish and Wildlife.

Berry, D. K. 1994. Alberta's bull trout management and recovery plan. Edmonton, AB: Alberta Environmental Protection, Fish and Wildlife Services, Fisheries Management.

Berry, D. K. 1995. Alberta's golden trout management plan. Edmonton, AB: Alberta Environmental Protection, Natural Resources Services, Fisheries Management.

Brewin, M. K. 1991. Assessment of bull trout (*Salvelinus confluentus*) spawning activity using redd counts in the Upper Clearwater River. Edmonton, AB: Alberta Enhancement Fund, Alberta Fish and Wildlife.

Brown, R. S., and W. C. Mackay. 1995. Spawning ecology of cutthroat (*Oncorhynchus clarki*) in the Ram River, Alberta. *Canadian Journal of Fish and Aquatic Science* 52:983-92.

Gardiner, K., K. Fitzsimmons, and D. Rystephanuk. 2001. Cooperative Fisheries Inventory Program. Catalogue of sample sites conducted in 1998/99 and 1999/2000. Rocky Mountain House, AB: Alberta Conservation Association Report.

Gardiner, K., and S. Herman. 2001. Upper North Saskatchewan River bull trout assessment. Rocky Mountain House, AB: Alberta Conservation Association Report.

Nelson, J. S., and M. J. Paetz. 1992. *The fishes of Alberta*. Edmonton, AB: University of Alberta Press and University of Calgary Press.

Parks and Protected Areas Publication #1/800.

Rees, K. 1992. Clearwater bull trout project: Interim report. Edmonton, AB: Alberta Forestry, Lands and Wildlife, Fish and Wildlife.

Salt, R., and B. Wilk. 1966. *Birds of Alberta*. Edmonton, AB: Queens Printer.

Tebby, C. D. 1974. Fishes of Abraham Lake (Reservoir) and the upper North Saskatchewan River, Alberta. Master's thesis, University of Alberta.

CHAPTER 15

Andersen, R. R. 1970. Alberta Stoney (Assiniboine) origins and adaptations: A case for reappraisal. St. John's, NF: Memorial University.

Reeves, B. Personal communication, January, 2003.

Snow, Chief J. 1977. *These mountains are our sacred places: The story of the Stoney Indians*. Toronto: Samuel-Stevens.

De Paola, P. Personal communication, January, 2003.

Getty, W. E. A. 1973. Perception as an agent of sociocultural change for the Stoney Indians of Alberta. Master's thesis, University of Calgary.

Jonker, P. M. 1983. Stoney history notes. Morley, AB: Chiniki Band.

Kariel, P., and E. Schneider. 1995. *Hiking Alberta's David Thompson Country*. Calgary, AB: Greenways Press.

Kennedy, Michael S. (ed.). 1961. *The Assiniboines*. Norman, OK: University of Oklahoma Press.

Reddekopp, G.N. 1997. The Wesley Stoney claim to the Kootenay Plains. Edmonton, AB: Alberta Aboriginal Affairs.

Bradshaw, D. 1999. Our voices echo in Bighorn Country. *Edmonton Journal*. March 14, 1999. Edmonton, AB.

CHAPTER 16

Belyea, B. 1994. *Columbia journals: David Thompson*. Montreal: McGill-Queen's University Press.

Karamitsanis, A. 1991. *Place names of Alberta*. Vol. 1. Mountains, mountain parks and foothills. Calgary, AB: University of Calgary Press.

McCart, J., and P. McCart. 2000. *On the road with David Thompson*. Calgary, AB: Fifth House.

Schäffer, M. 1911. *Old Indian trails of the Canadian Rockies*. Republished as *A hunter of peace*, 1980. Banff, AB: Whyte Museum of the Canadian Rockies.

Southesk, Earl of. 1875. Saskatchewan and the Rocky Mountains: A diary and narrative of travel, sport, and adventure, during a journey through the Hudson's Bay Company's territories, in 1859 and 1860. Facsimile edition, 1969. Edmonton, AB: M. G. Hurtig, Ltd.

Spry, I. (ed). 1968. *The papers of the Palliser Expedition 1857-1860*. Toronto: The Champlain Society.

CHAPTER 17

Hart, E. J. 1980. *A hunter of peace: Mary T. S. Schäffer's Old Indian trails of the Canadian Rockies*. Banff, AB: Whyte Museum of the Canadian Rockies.

Hart, E. J. 1979. *Diamond hitch*. Banff, AB: Summerthought Ltd.

Mckenzie, M. Personal communication, 2002.

Sands, C. Personal communication, 2002.

CHAPTER 18

Bingham, G., R. Bishop, M. Brody, D. Bromley, E. Clark, W. Cooper, R. Costanza, T. Hale, G. Hayden, S. Kellert, R. Norgaard, B. Norton, J. Payne, C. Russell, and G. Suter. 1995. Issues in ecosystem valuation: Improving information for decision making. *Ecological Economics* 14:73-90.

Costanza, R., R. d'Arge, R. de Groot, S. Farber, M. Grasso, B. Hannon, K. Limburg, S. Naeem, R. V. O'Neill, J. Paruelo, R. G. Raskin, P. Sutton, and M. van den Belt. 1997. The value of the world's ecosystem services and natural capital. *Nature* 387:253-60.

Covault, J. 1992. Wilderness: Its role in our economy. In *The economic value of wilderness: Proceedings of the conference*. Jackson, WY: United States Department of Agriculture.

Dobson, S., and J. Thompson. 1996. Parks and protected areas: Their contribution to the Alberta economy – A discussion paper. Edmonton, AB: Alberta Environmental Protection.

Environment Canada. 2000. The importance of nature to Canadians: The economic significance of nature-related activities. Ottawa: Environment Canada.

Scott, A. C. 1992. Valuing wilderness benefits: Alternatives to economic measures. In *The economic value of wilderness: Proceedings of the conference*. Jackson, WY: United States Department of Agriculture.

Turner, R. K., W. N. Adger, and R. Brouwer. 1998. Ecosystem services value, research needs, and policy relevance: A commentary. *Ecological Economics* 25:61-65.

PHOTO CREDITS

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CYNDI SMITH
Page 111 right.

TAMAINI SNAITH
Pages 8 left, 45, 49, 72 left, 75 right and 94 right. Front Cover left.

DON WALES
Pages 60 left, 60 centre, 60 right, 61, 62 both, 63, 72 centre, 72 right, 73, 74, 75 left, 76 left, 76 centre, 76 right, 77, 78, 79, 80, 81, 95, 98 and 100 lower.

CLEVE WERSHLER
Pages 104 left, 113 and 124.

ARCHIVES OF THE CANADIAN ROCKIES
Page 128.

UNKNOWN
Pages 136, 140 and 142.

AUTHORS' BIOGRAPHIES

ROD BURNS is a fisheries manager with Alberta Sustainable Resource Development, Fish and Wildlife Division. An avid birder for many years, Rod is keenly interested in the protection of the Bighorn Wildland as prime wildlife habitat.

JULIE COOK grew up in rural Ontario and in 1968 moved to Alberta, where her earlier-discovered love of nature could flourish. Between 1989 and 1993, she and her husband were campground caretakers in the Nordegg area, and the Kootenay Plains became their focus for nature study and photography.

DOROTHY DICKSON was born in Australia and educated in England before coming to Canada with her husband and children in 1963. Dorothy has been active with AWA since 1971 and remains active with national and local conservation groups. She served as vice-chair of the Public Advisory Committee to the Environment Conservation Authority, and for her efforts, received awards and lifetime memberships from the Canadian Nature Federation and the Federation of Alberta Naturalists. She has travelled in the Bighorn for 30 years.

ALAN ERNST was born in Switzerland and his primary career was in international banking. In 1997 Alan and his wife, Madeleine, decided to combine a love for nature with a new business challenge, an ecotourism venture called Aurum Lodge. The David Thompson Highway through the Bighorn area was chosen as the site for the lodge because this was the only accessible area in the Eastern Slopes that had not been significantly affected by industry and development.

ELAINE GORDON attended the University of Alberta, gaining a B.Sc. in plant systematics and an M.Sc. in plant systematics and ecology. She teaches botany, plant identification and environmental studies, and is developing a series of books and workshops on basic plant identification for children and adults.

ROGER MACQUEEN is an emeritus scientist at the Geological Survey of Canada, having received his B.Sc. and M.Sc. from the University of Toronto and his Ph.D. in geology from Princeton. Many parts of Canada, Europe and the Middle East have known his geological scrutiny, and he has published more than a hundred papers on aspects of geology. He has taught at the Universities of Waterloo and Toronto. Roger served for five years as editor of the journal *Geoscience Canada* and is currently associate editor of a Geoscience Canada series of papers on Geology and Wine.

ANDY MARSHALL is a former Alberta daily newspaper journalist living in Cochrane. He founded and operated for five years two weekly newspapers: the *Airdrie Echo* and the *Rocky View Times*. Andy is a frequent contributor to the *Wild Lands Advocate*, the journal of Alberta Wilderness Association.

JOYCE MCCART has a B.A. in Philosophy, a B.Ed. in English and a background in technical writing. Her recent interest in Canadian history resulted in the publication of the travel guide *On the road with David Thompson*.

LUIGI MORGANTINI gained one Ph.D. in science from the University of Rome and a second Ph.D. from the University of Alberta in wildlife productivity and management. He has worked in environmental research and management for more than 25 years. Luigi is currently the chief biologist and forest ecologist coordinator for Weyerhaeuser Canada and is an adjunct professor at the University of Alberta. He is the recipient of Alberta's Emerald Award for life-long environmental stewardship and of a Wildlife Habitat Canada award for leadership in caribou conservation.

VIVIAN PHARIS holds degrees in biology and education and is a veteran environmental advocate. Vivian and her husband, Richard, have travelled the Bighorn by foot and by horse for more than 30 years. They are both past-presidents of Alberta Wilderness Association and Vivian is currently a director of the Association.

ROBERT STEVENSON was raised in the Calgary area and attended university in Idaho, obtaining an M.Sc. in forestry. Bob worked for the Canadian Forest Service in Alberta and the N.W.T. before transferring to the Alberta Fish and Wildlife Division in 1980. There he served as director of Information and Extension Services; he retired in 1992 from his position as head of Commercial Wildlife. Bob remains active in researching Alberta's forestry and wildlife management history and in taking backcountry horse trips to pursue his hobby of repeat photography of the province's landscape.

HEINZ UNGER was born in Vienna, Austria and is a professional engineer. Heinz has more than 35 years of Canadian and international experience in water resources engineering, including working for the environment department of the World Bank in Washington D.C. Locally, he has recently joined the Board of Directors of Alberta Wilderness Association and is active on the Bow River Basin Council.

DON WALES is a recently retired natural sciences instructor from Red Deer College. Don is a life-long avid backpacker, cross-country skier and kayaker. He has circumnavigated Baffin Island and explored much of the Labrador coastline by kayak. Over the years Don has guided multi-day backpacking trips for Canadian Nature Tours and Blackfeather. He has extensive knowledge of the Bighorn Wildland and neighbouring landscapes.

KENNETH ZELT obtained a B.Sc. and an M.Sc. from the University of Alberta in zoology and aquatic ecology. He then worked as a fisheries biologist with the Alberta government until his retirement in 2000. Ken's other primary interest is horses and travelling with them in the backcountry. He has served as president and on the boards of several provincial equestrian groups and is currently vice-president of recreation for the Alberta Equestrian Federation.

*This book has been designed and written to tell the story of the Bighorn Wildland.
It is also an invitation to become more personally involved in its destiny.*

