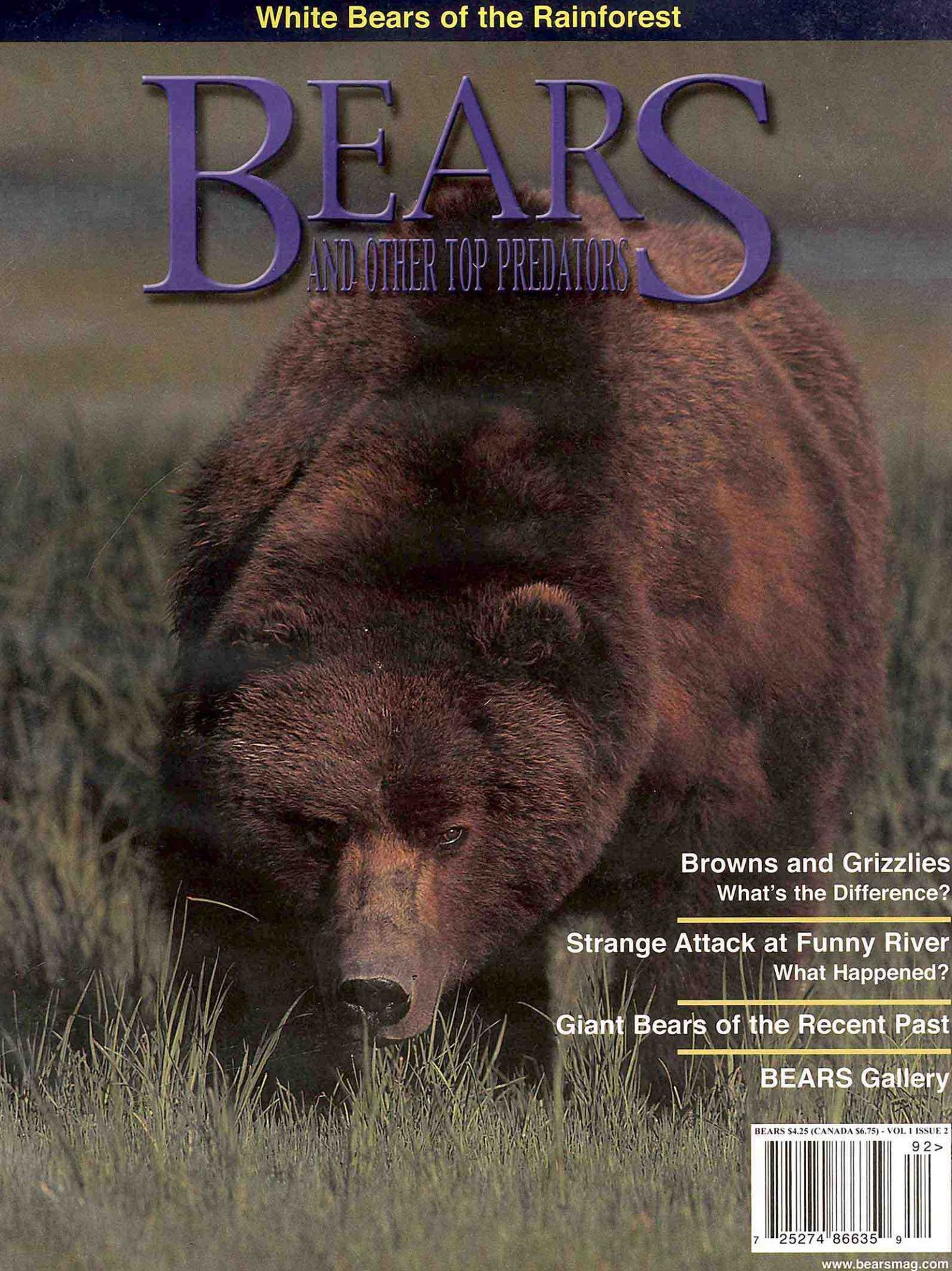
White Bears of the Rainforest

BEARS

AND OTHER TOP PREDATORS



Browns and Grizzlies
What's the Difference?

Strange Attack at Funny River
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Giant Bears of the Recent Past

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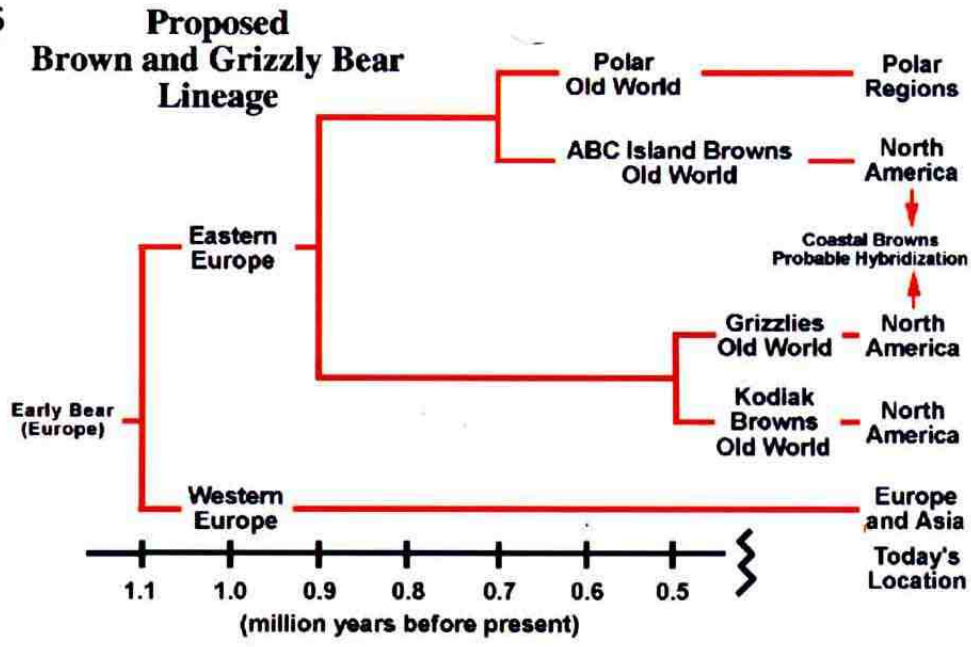
Tracking the Great Bear

The Grizzly Differences

By Jim Halfpenny, Ph.D.



North American polar bears, grizzlies, and brown bears all descend from European brown bears.

On May 5, 1805, a rifle shot rang out along the Missouri River Breaks in eastern Montana marking the start of the great brown bear/grizzly bear classification controversy in North America. The members of the Lewis and Clark Expedition had shot what they believed to be a new species of bear. Grizzlies, as the new bears would soon be called, were not then recognized as the same species of brown bear already known to exist in Europe and Asia. In 1758, European brown bears had been given the scientific name *Ursus arctos*, by Carolus Linnaeus, based on a bear from Sweden. In 1815, Dr. G. Ord gave the Lewis and Clark bear its own scientific name, *Ursus horribilis*, the horrible bear, after its fierce reputation earned during scraps with members of the expedition.

By 1854, Audubon and Bachman recognized only Ord's grizzly in their monumental work, *Mammals of North America*. But the west was young and reputations were yet to be made by finding and describing new species. Besides, the awe inspiring grizzly deserved a special respect and place in the biological and hunting legends. Hunters as much as anyone generated the frenzy to identify new species. The hunting community had recognized that the large brown bears of some Alaskan Islands and along the coast of Alaska and British Columbia appeared visually different than interior grizzlies. The maritime bears were larger, darker (less grizzled), and had massive skulls. Hunters called on the taxonomists to recognize these differences and certainly felt the differences necessitated specific status.

Rising to the task was C. Hart Merriam, former chief of the Biological Survey (now Fish and Wildlife Service) and research associate for the Smithsonian Museum. By 1896, Merriam identified eight species of grizzly and big brown bears (five new), but this was only a precursor to what was to come. Enlisting the help of "hunter-naturalists," Merriam secured the greatest collection of bear skulls in existence. When his measuring and studying tasks were accomplished, Merriam published the "Review of the Grizzly and Big Brown Bears of North America" (1918, North American Fauna, no. 41, Bureau of Biological Survey). He recognized 86 species of grizzlies. Eventually the number grew to 94 recognized species and subspecies!

In a feat of taxonomic splitting, Merriam recognized five species in a small area of Arizona and New Mexico, four species in Colorado, five species in the Yellowstone region, and five species on Admiralty Island. Merriam felt that " . . . species inhabiting easily accessible areas were either exterminated or forced into the mountains where they now occupy the same ground with other species, so that it is impossible to ascertain what the original distribution was." Paleontologist Bjorn Kurten, later reflecting on these endless taxonomic divisions, regretfully concluded that "the taxonomic efforts reflected in this incredible list of names have done little to further the understanding of the systematics of the brown and grizzly bears."

Enter the second generation of scientists who discounted the variations caused by size, gender, and regional differences, focusing instead on successful interbreeding as the primary criterion defining a species. Subspecies, to these scientists, were defined by recognizable forms more consistent within a group than between groups, a circumstance often perpetuated by geographic isolation.

The second generation of scientists worked largely by measuring and comparing skulls. Studying an extensive series of bear skulls in 1963, Dr. Robert Rausch differentiated a very large

coastal and insular form in Alaska and British Columbia from a somewhat smaller form in the interior of North America. Recognizing both forms as subspecies of the Old World *Ursus arctos*, he gave them the subspecific names *U. a. middendorffi* and *U. a. horribilis*, respectively. In 1974, Kurten expanded Rausch's study using additional skull measurements and recognized three subspecies, acknowledging the old name *U. a. dalli*. In brief, the characteristics of these species were: *U. a. middendorffi*—broader skull than other subspecies, and larger than grizzlies, found on Kodiak and Afognak Islands; *U. a. dalli*—broader skull and larger than grizzlies, found on the south coast of Alaska and west coast of British Columbia; and *U. a. horribilis*—smaller in both size and skull width, found in interior North America.

Currently the third generation of scientists, employing DNA analysis as their primary research tool, are working to unravel genetic relationships within the bear clan. Within the DNA helix lies the chromosomal material that contains a genetic record of lineage and, with the proper analytical techniques, can even yield estimates of time since ancestors diverged. Because techniques are new, interpretations often differ, but refinement of the techniques are providing more detailed views into the past and current genetic relationships.

Dr. Lisette Waits determined that bears from the Admiralty, Baranof, and Chichagof (ABC) Islands were distantly related to a group that includes two subdivisions, one on Kodiak Island and the other consisting of interior bears. The two main groups diverged about 900,000 years ago and the Kodiak group diverged from its sister group about 500,000 years ago. More recent research by David Paetkau, Gerald Shields, and Curtis Strobeck suggests that the Kodiak Island bears are, indeed, isolated. However, their research fails to show complete isolation among the ABC islands, coastal mainland, and interior bears, suggesting genetic interbreeding. Certainly interior grizzlies have been known to migrate to the coast.

In light of recent studies, I suggest the following scenario. About 1.1 million years before present (YBP), the bears of Europe differentiated into a Western stock and an Eastern stock (see chart on page 11). The Eastern stock diverged again about 900,000 years ago into two lineages.

In the Old World, the first lineage of the Eastern stock diverged once again 700,000 years ago (maybe as late as 500,000 YBP) into polar bears and a line of brown bears. Early in the ice age, some of the brown bears migrated to the new world, probably along a coastal route, to settle on the ABC islands.

In the Old World about 500,000 YBP, the second lineage of the Eastern stock also divided into two lines which eventually migrated to the new world. The first line arrived just before the end of the Ice Age and set-

tled on Kodiak Island. The second line arrived just after the end of the Ice Age, about 12,000 to 10,000 YBP. The late-comers, who moved south between the retreating mountain and continental ice caps into the interior of North America were the grizzlies.

While traditional thought held that grizzlies/brown bears reached interior North America 12,000 years ago, a recent find in Oregon of a bear skull dated over 30,000 YBP supports at least one earlier migration, possibly along a coastal route. To complete my scenario, after the Ice Age, interior grizzlies migrated out to the coast and finally the ABC Islands, where hybridization between coastal and interior forms muted the distinctive physical expressions of original colonizing populations.

Jim Halfpenny and Diann Thompson snowshoeing by Yellowstone National Park's Old Faithful. Jim owns and operates A Naturalist's World in Gardiner, Montana.