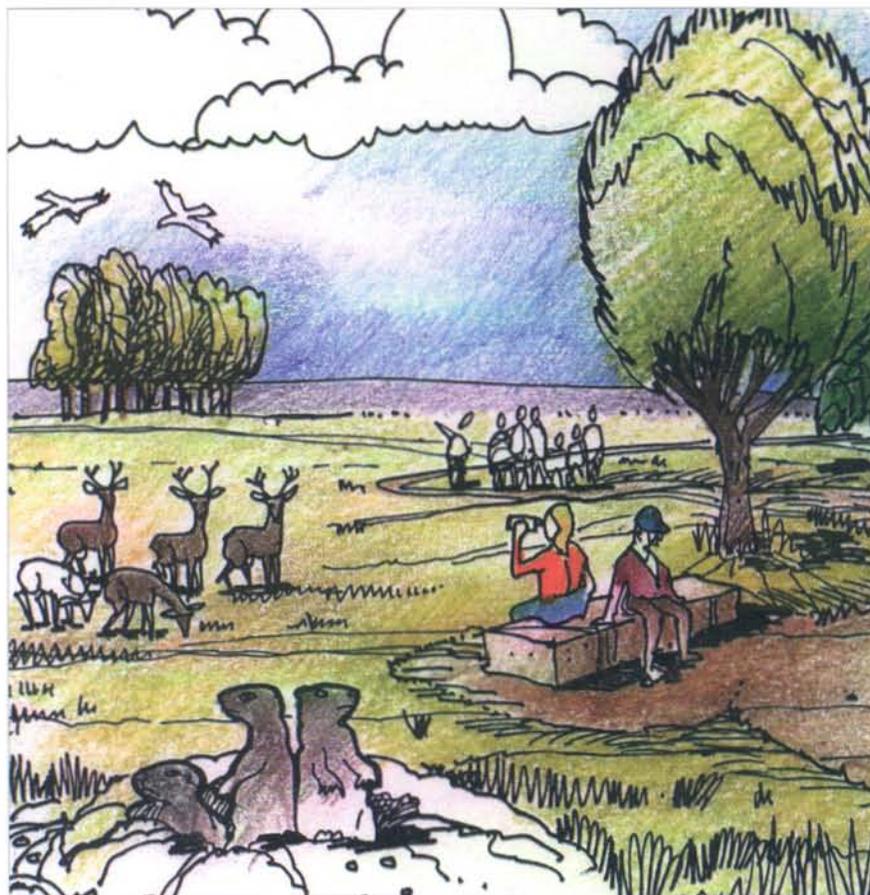


# ROCKY MOUNTAIN ARSENAL NATIONAL WILDLIFE REFUGE

COMMERCE CITY, COLORADO



## ■ COMPREHENSIVE MANAGEMENT PLAN ■

MARCH 1996



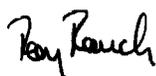
Fellow Citizens and Interested Readers:

The U. S. Fish and Wildlife Service is proud to present to you the Comprehensive Management Plan for the Rocky Mountain Arsenal National Wildlife Refuge. This plan and its supporting documents outline a vision for the development of the Refuge and specify how one of America's newest and largest refuges will be developed to conserve wildlife while providing enjoyment to people.

Vitally important to successfully developing the Refuge will be active community participation. We invite you to learn—from this plan and from visits to the Refuge—more about the Refuge, its purposes and prospects, and to become involved in making it all that it can be.

The staff of the Rocky Mountain Arsenal National Wildlife Refuge would like to express special thanks to the National Fish and Wildlife Foundation, Shell Oil Company, and King Soopers for their financial assistance in support of this Comprehensive Management Plan. Thanks also to the all of the people who participated in public meetings and focus groups or who sent in comments during the planning process.

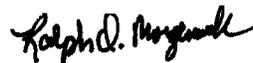
For the U.S. Fish and Wildlife Service:



Ray Rauch  
*Project Leader,  
Rocky Mountain Arsenal  
National Wildlife Refuge*



Joseph J. Webster  
*Geographic Assistant  
Regional Director*



Ralph O. Morgenweck  
*Regional Director, Region 6*

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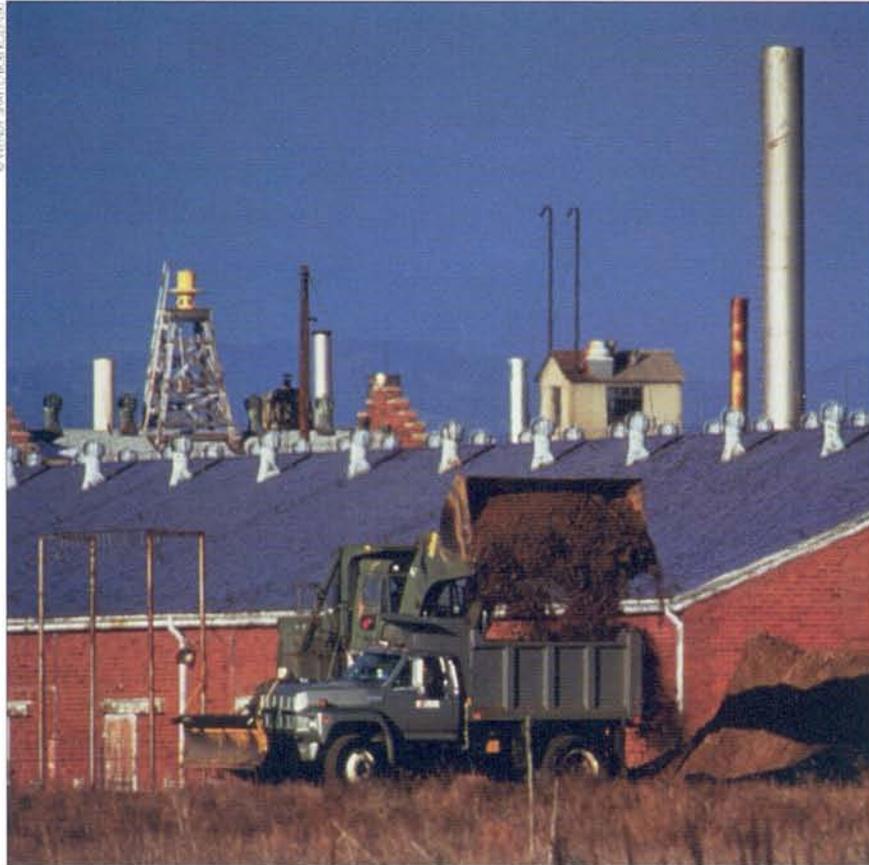
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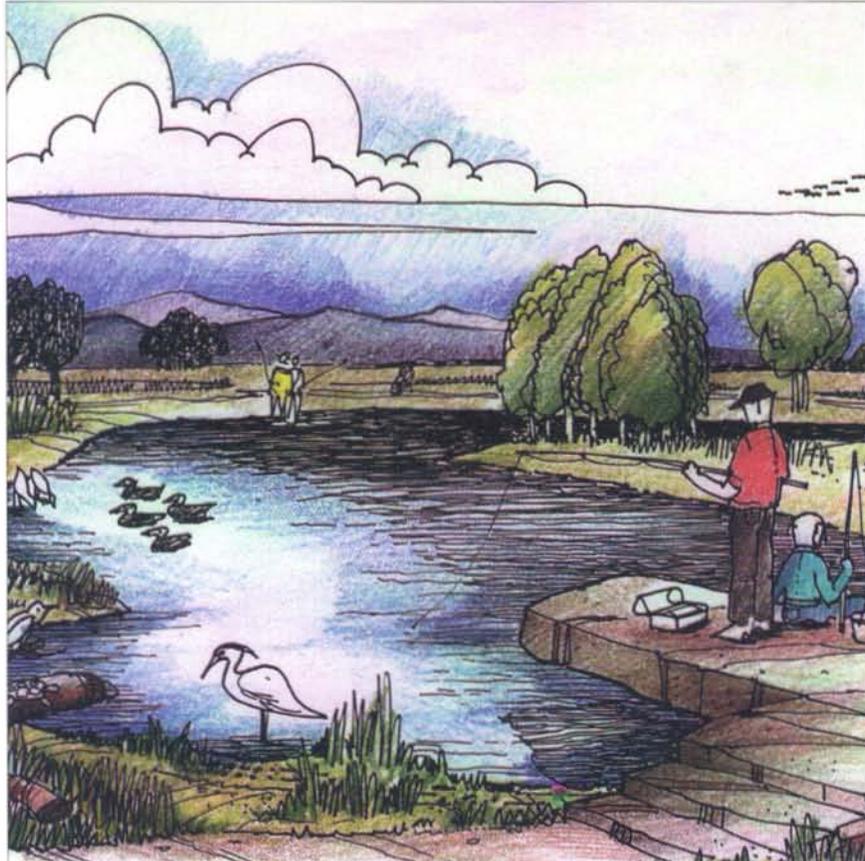
**P**ARADOX. That's the word most often used to describe the place near Commerce City, Colorado that is becoming the **Rocky Mountain Arsenal National Wildlife Refuge**. It is both a wildlife refuge and a Superfund cleanup site. It is a large natural area—almost 27 square miles of open land—yet it is only ten miles from downtown Denver. It has been a source of contamination and concern; it is becoming a source of pride and potential. At present, portions of the site are used for **environmental education** and for **viewing wildlife** such as deer, eagles, prairie dogs, and hawks. In ten to fifteen years—after environmental cleanup is complete—almost all of the site will serve as a wildlife refuge and a permanent part of the **National Wildlife Refuge System**. Few cities have as large a **natural area** as Denver does in the Arsenal Refuge. The Refuge provides a welcome contrast to the surrounding city for both wildlife and people. The extraordinary **abundance of wildlife**—some species are found in greater numbers here than anywhere else along the Front Range—exists today because part of the site was used for forty years to make **weapons, fuel, and pesticides**. The fascinating history of the Rocky Mountain Arsenal is a story very much worth learning from.



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The Rocky Mountain Arsenal is undergoing a transformation  
from a military installation, a chemical production facility,  
and a Superfund cleanup site ...





...into one of America's largest urban wildlife refuges, a place of refuge for wildlife and enjoyment for people, a place to demonstrate environmental stewardship and responsibility.



**LONG AGO** the site of the Arsenal was covered by **shortgrass prairie**. Later, it became **farmland**, and then an army **arsenal**. Each use has left its mark and helped shape the unique character of one of our nation's newest urban wildlife refuges. For thousands of years, the Refuge was prairie, home to a natural community of plants and animals which had evolved on the **high plains** along Colorado's Front Range. Vast herds of bison roamed freely, while bands of **pre-historic people** moved from place to place following the availability of wild foods. By the early 1800s, Plains Indians like the **Arapaho** and **Cheyenne** roamed along the Front Range, following the bison herds. Well-adapted to prairie life, these hunters on horseback made efficient use of their primary game animal—bison—which yielded food, clothing and tools. In 1942, America was gearing up for **World War II**. That year, the U.S. Army purchased nearly 20,000 acres of land north of Denver to build a weapons plant—the Rocky Mountain Arsenal. The **weapons plant** was constructed in the center of the Arsenal, with a buffer zone of open land around the perimeter. When the Army bought the site in 1942, almost all the native prairie had been plowed for growing **crops**. Farmers had built lakes and planted trees, thereby creating important **wildlife habitat**.



**AFTER WORLD WAR II** was won, the Rocky Mountain Arsenal's industrial plant was converted to production of **agricultural chemicals and pesticides** to aid in growing crops. In the late 1940s and early 50s, as the need for chemical weapons diminished, the Army leased portions of the Arsenal to private companies. With continued operation, the facilities would be in good repair and ready in the event of another national emergency. During this time, **Shell Oil Company** made agricultural pesticides at the site. **Cold War** tensions, exacerbated by the North Korean invasion of South Korea, resulted in the Arsenal being reactivated. During the conflict, white phosphorous-filled bombs, artillery shells with distilled mustard, and incendiary cluster bombs were manufactured. Of greater significance, though, was the decision to begin manufacturing at the Arsenal a highly toxic chemical product, known generically as **nerve agent**. The **North Plants** were constructed for this purpose with production beginning in 1953 and continuing intermittently until 1969. Cold War fears kept the Arsenal an active military base until 1982, when manufacturing operations at the Arsenal ceased. The following year the U.S. Environmental Protection Agency listed the Arsenal as a **Superfund Cleanup site**.



**HAZARDOUS WASTE** was a concept few people had thought much about during the 1940s and 50s. Using disposal practices typical of the time, manufacturing wastes were treated and discharged into **evaporation basins**. There were unexpected consequences related to this disposal process. By the early 1950s, chemical wastes were discovered leaching through the soil into the **ground water**. Farmers north of the Arsenal believed that well water was damaging their crops. Contamination also affected wildlife, mainly water-fowl using the lower lakes and waste basins. Cleanup engineers were faced with substantial challenges. While the final cleanup approach was being determined, **interim programs** dealt with immediate cleanup needs. More than 11 million gallons of hazardous liquids from one of the site's most contaminated areas were safely destroyed. Each year one billion gallons of **ground water** are pumped to the surface, treated, and then returned to the ground. The final Arsenal **cleanup**, to be paid for by the Department of Defense and Shell Oil Company, will take from 10 to 15 years and cost approximately **\$2 billion**. The contaminated soils of greatest concern will be collected into a hazardous waste **landfill** on the site. Less problematic soils will be capped, covered with topsoil, and revegetated.



**AN AMAZING DISCOVERY** was made as public attention focused on environmental cleanup of the Arsenal. **Bald eagles**—then listed as an endangered species—were found using the Arsenal as a wintering site. Despite contamination in the core area, the relatively undisturbed **buffer zone** around the core production areas provided food, shelter, and freedom from human disturbance. In 1987, the **U.S. Fish and Wildlife Service** began managing the site’s abundant wildlife as cleanup went forward. Five years later, in recognition of its tremendous resources, the **Rocky Mountain Arsenal National Wildlife Refuge Act** was passed by Congress. The Refuge’s **biological communities** form the basis of the Refuge. They are what is to be carefully managed and they are why most people will visit the Refuge. These communities include grasslands, former homesteads, streams and other aquatic areas, and the wildlife that inhabit these places. **Grasslands** form the largest biological community on the Refuge, supporting a variety of wildlife species, such as deer, prairie dogs, and burrowing owls. The Refuge grassland communities will be managed to benefit the diverse wildlife community that presently exists, and other native species that may be reintroduced. Long before the Refuge was used for the manufacturing of ammunitions during



World War II, much of the area was farmed or grazed. Both native and non-native **trees and shrubs** were planted near homesteads. This vegetation provides important habitat for neotropical migratory songbirds, and important cover, perch, and nest sites for **raptors**, such as hawks, eagles and owls. These plants also provide cover for **deer** and other species. Several types of **aquatic communities** exist on the Refuge. Four reservoirs or artificial **lakes** are found in the southern zone. **Wetlands** are found surrounding the lakes, along First Creek, and in small ponds and drainages elsewhere on the Refuge. The lakes and wetlands provide habitat for a variety of fish and wildlife. **First Creek** flows northwest from the southeastern corner of the Refuge, exiting the Refuge at the northern boundary. It is the **cottonwood trees** along First Creek that provide a communal roost for wintering bald eagles and serve many other functions for wildlife. Several **species of special interest** are found at the Refuge: deer, bald eagles, prairie dogs, ferruginous hawks, and burrowing owls. Bald eagles and other raptors are attracted to the Refuge by the abundance of **prairie dogs** and other small mammals, the availability of water and loafing sites, and the relatively undisturbed and secure communal roost. **Ferruginous hawks**, a candidate species for listing



as threatened or endangered, use the Refuge during winter months. **Prairie dogs** are critical to the grassland biological community found throughout the Refuge. They are a **keystone species** which provides a prey base for raptors, coyotes, badgers and other predators. In addition to the species already found at the Refuge, the Service is considering reintroducing four native species that are not currently found there: **bison, pronghorn antelope, prairie chicken, and plains sharp-tailed grouse**. In addition to its impressive biological resources, important **prehistoric and historic cultural resources** also exist on the Refuge. Henderson Hill, in the northern part of the Refuge, served as a campsite for nomadic **hunter-gatherers** who migrated to North America between 40,000 and 12,000 B.C. By the early 1500s, **Apache tribes** occupied the area of the Refuge, followed by the **Comanches, Utes, Arapahoes and Northern Cheyennes**. Evidence of this use survives today as stone flakes from spearheads and knives, fire-cracked rocks used for cooking, and hammer and grinding stones. **Artifacts** of these and more recent human use, such as **buildings** associated with farming, ranching, and chemical production, may also be found on the Refuge. Most buildings, however, will be removed during environmental cleanup, because they are contaminated.





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Among the more than 300 species of wildlife found at the Rocky Mountain Arsenal National Wildlife Refuge are (clockwise from upper left): great blue heron, badger, bald eagle, bullfrogs,...





...and coyote, western tanager, racer, mule deer.



**VISITORS TO THE REFUGE** in the **future** will take part in a wide range of **activities** related to **environmental education, interpretation, and recreation**. School children, for example, will participate in hands-on environmental education programs. These programs will teach students concepts they can apply elsewhere, and provide a behind-the-scenes perspective on the ecology of the Refuge and how it is managed. Interpretive programs for the general public will be available on the tram, as well as on foot or bicycle. Through these and other programs, people will learn about **environmental stewardship** by seeing it demonstrated firsthand in the care being given the Refuge. The specifics of the Refuge—its wildlife, history, and even cleanup activities—will be springboards to present broader concepts of environmental responsibility. **Wildlife-oriented recreation**, such as **photographing nature** and **observing wildlife** on foot or **bicycle**, will be other activities which allow the public to experience nature firsthand. Facilities will be constructed to help people learn about and enjoy the Refuge. The **Visitor Learning Center**, for example, will be the location of many visitor programs, particularly those that include activities or concepts for which few or no physical artifacts remain on the site.



**THE REFUGE COMPREHENSIVE MANAGEMENT PLAN** was completed by the U.S. Fish and Wildlife Service in winter 1995-96. The plan strives to protect the needs of **wildlife** while allowing **people** to enjoy many wildlife-oriented activities—a dual goal called for in the legislative act that created the Refuge. Many people—from local children to senior citizens, from technical consultants to dedicated volunteers, from neighborhood groups to governmental agencies—helped create the plan for the future of the Refuge. The plan acknowledges the significant opportunity for appropriate **public use** of the Refuge because of its unique location within this metropolitan area. (Approximately two million people live within an hour's drive of the Refuge.) Special care will be given to keep public use **compatible** with wildlife management goals. For example, during some times of the year, such as when bald eagles are using the First Creek area for winter roosts, people will be excluded from nearby areas. This kind of careful **choreography** will make possible meaningful and enjoyable experience of the Refuge while still sustaining and enhancing wildlife and their habitats. The final plan, described in this report, outlines how and when the Refuge will be developed and what its program goals are.



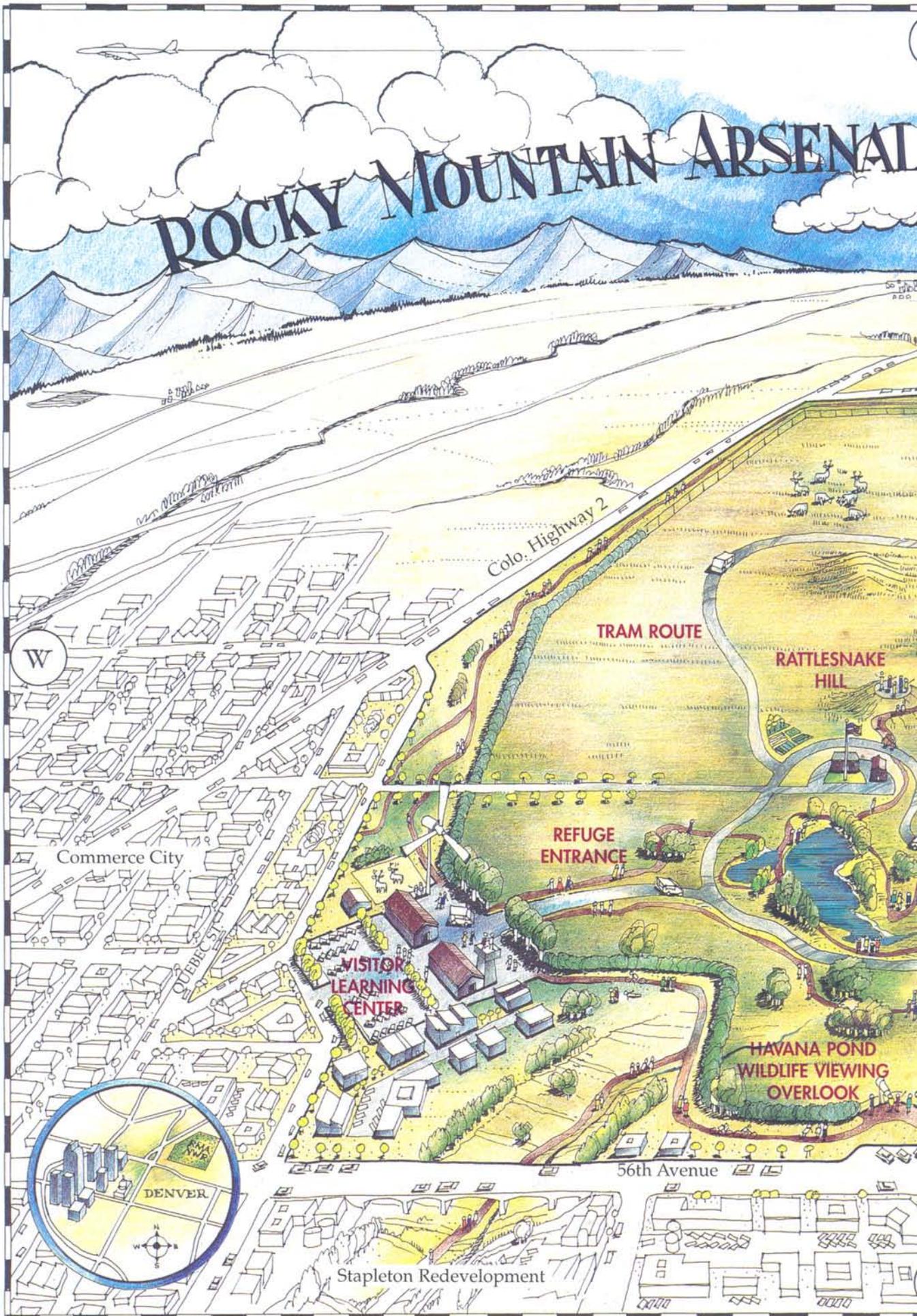
**TEN BROAD PLANNING PRINCIPLES** emerged in discussions with the public and other interested parties: **1.** So that valuable lessons can be learned, the plan for the Refuge must be true to the history of the site, whether that history was pleasant or not. **2.** The site is extremely complex and its story should not be over-simplified. **3.** Intrusions in the Refuge—such as roads and buildings—should be kept to a minimum so that the site does not become cluttered. **4.** The ways that the Refuge is managed must demonstrate the same principle that the Refuge aims to teach—environmental stewardship. **5.** Environmental education at the Refuge must aim to move people beyond wanting to hear interesting facts about nature, to wanting to take action on behalf of the environment. **6.** The Refuge should be both a reserve for wildlife and a place for people to experience nature. **7.** There should be a continuous, special effort made to reach and involve the Refuge’s neighbors. **8.** The Refuge’s planning—and management—process should be open and public. **9.** Recognizing the fiscal realities of our times, the Refuge must enter into partnerships to aid in achieving its goals. **10.** The diverse goals set for the Refuge by the public and by Congress are best achieved through identifying separate management zones at the Refuge.



**A STAFF** of approximately 75 people will be needed to run the Refuge once it is developed at a projected cost of \$65 million according to the Comprehensive Management Plan. Development will be phased over a period of years. Each phase has associated with it specific projects and project costs and corresponds to phases of environmental cleanup. Because there are many clean areas across the Refuge, people can enjoy it even now. **AN IMAGINARY TOUR** of the future Refuge follows. It is the kind of tour that will be possible perhaps five to ten years from now, once environmental cleanup is complete. Your tour starts with an exploration of the **Visitor Learning Center**. In the heart of the **Gateway** to the Refuge lies a vibrant center for science and technology, where the Visitor Center shares a campus-like setting with businesses and research and educational institutions. Start your journey by parking your car. You won't need it for this adventure. Wander on the campus through interactive **exhibits** developed jointly by cooperating organizations on the campus. You might visit a prairie dog home or travel back in time to when the Refuge played a critical role as a U.S. Army Arsenal. Have lunch in the **café**. Watch a wildlife program in the **theater**. Browse through the **bookstore**—one of many shops and activities at the Center. Head



# ROCKY MOUNTAIN ARSENAL



# NATIONAL WILDLIFE REFUGE



HENDERSON HILL  
WILDLIFE VIEWING OVERLOOK

96th Avenue

THE LAKES

THE WETLANDS

EAGLE  
WATCH  
VIEWING  
AREA

WILDLIFE VIEWING AREA

Montbello Neighborhood (Denver)

ASHBY  
9-10-95

back to the door, and hike or bike along the miles of **trails** around and through the Refuge. Or hop on the open-air tram for a guided look at wildlife in the great outdoors. **The Lakes Area** along the southern tram route will likely be your first stop. Built originally for irrigation, these lakes and canals now attract shore birds, water birds and other migratory birds. Watch the resident Canada geese grazing on the grassy banks or the ducks diving in open water. You may see a white pelican on the lakes, or a northern oriole in one of the cottonwood trees nearby. Another stop will be the **wetlands** created to make up for habitat lost during environmental cleanup. Shore birds and wading birds like avocets can be seen dipping their bills into the water for food. Frogs and snakes also call this home. **Rattlesnake Hill** is your next stop, where a short walk will give you a panoramic view of Denver and the Rockies as well as the cleanup areas of the Arsenal. From here, another option is to take the northern tram route to get a first-hand view of what much of the Front Range looked like in earlier times—native shortgrass prairie. Look for bison, pronghorn antelope, or prairie chickens along the way. These species were once an important part of the landscape. They were reintroduced after the cleanup because they play a vital role in sustaining the prairie. When your



tram ride returns to the Visitor Learning Center, don't get back into your car. There's much more to see and do. Take the **perimeter trail** and hike, bike, jog, or roller-blade along the outside of the Refuge. As you move along the Refuge's edge, look for active prairie dog colonies attracting hawks, burrowing owls, cottontail rabbits, coyotes and other prairie wildlife. Jackrabbits take shelter beneath native brush; white-tailed deer bound across open prairie disappearing into groves of trees. The **Havana Pond Wildlife Viewing Overlook** is accessed along 56th Avenue, now a busy thoroughfare since the closing of nearby Stapleton Airport. A few parking places make it an easy stop by car. The open water attracts a variety of ducks and waterbirds like western grebes. To the west is an undisturbed area of native yucca, rabbit-brush, blue grama, and buffalo grass. This is an ideal place for a kangaroo rat! The locust trees nearby provide good homes for songbirds, magpies, owls, and hawks. Just east of here, along the perimeter trail, urban runoff water has been used to create a wetland for wildlife. The **Henderson Hill Wildlife Viewing Overlook** is the high point along the Refuge's northern edge. The entire Refuge is visible from here, including capped areas of north and south plants where weapons and pesticides were once produced. To the



southwest lies the skyline of downtown Denver; to the east, Denver International Airport; to the west and northwest, Mt. Evans, Longs Peak and the mountains in-between. Near this point, bison and pronghorn antelope graze, recreating visions of times long past. The **Eagle Watch Viewing Area** provides visitors with a close-up view of eagles roosting along First Creek during the winter months. Watching eagles from this spot is one of the most popular features of the Refuge and has been for many years. You may want to spend more time back at the **Visitor Learning Center** or explore the **western zone** it sits within. This zone is the part of the Refuge that most clearly expresses the **partnerships** that are vital to the Refuge. Here **non-profit**, as well as, **for-profit organizations** that share objectives with the Refuge, have facilities and work in collaboration. **Commerce City**, in cooperation with the Fish & Wildlife Service, took the lead in planning this area. The **Stapleton Redevelopment Foundation** and the City and County of **Denver** developed the collaborative plan that guided the development of the adjacent former Stapleton airport and helped integrate this area and the Refuge. Together each of these partners, and some still to come, are helping each day to make the Refuge better for wildlife and for people.



