



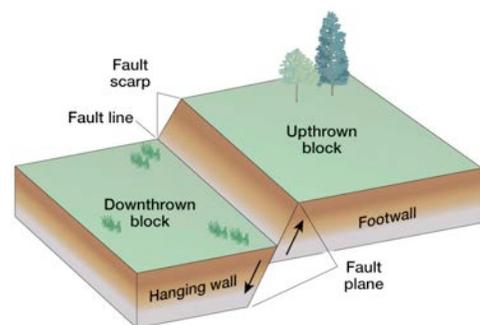
U.S. Fish & Wildlife Service

Crystal Hill Area *Kofa National Wildlife Refuge*

Crystal Hill, located in the northwest corner of Kofa National Wildlife Refuge in the Livingston Hills, is the only area within the refuge where recreational rock or mineral collecting is permitted. Quartz crystals are hidden in the washes and on the rocky slopes of Crystal Hill, making this an ideal location for rockhounding or collecting. While searching for quartz crystals at the top of the hill, visitors can also enjoy the 360 degree view of the surrounding area.

Creation of the Mountains

The mountains of Kofa National Wildlife Refuge, which rise abruptly from the flat desert, are characteristic of the Basin and Range Province which covers much of the western United States and extends into northwestern Mexico. In this physiographic region, the Earth's crust and upper mantle thinned and cracked as they were stretched and pulled apart.



A fault created by crustal movement.
Illustration from <http://clasfaculty.ucdenver.edu/callen/1202/Battle/Build/Faulting/Faulting.html>

This crustal movement created faults and eventually led to the creation of mountains and valleys as the Earth's surface uplifted on the upthrown side of the fault and down-dropped on the lower side.

Over time, the block-faulted mountains weathered and eroded. Volcanic episodes also occurred within the refuge and thus the mountain ranges of Kofa National Wildlife Refuge contain old lava layers and volcanic rocks, such as basalt, volcanic tuff and obsidian.

The Crystal Hill area is the only region on Kofa NWR where rock collecting is permitted.



Quartz Formation

Quartz, belonging to the class of silicates, comprises approximately 12 percent of the Earth's crust. It is produced when the two most abundant elements in the surface of the Earth, oxygen and silicon, bond. Quartz crystallizes when volcanic magma cools and becomes solid.

Quartz appears in a variety of forms and shapes and varies from being clear to almost opaque. It may be found in the form of large grains, crystals or veins. Crystals can appear either as a single point or in a cluster. Pure quartz is white or colorless, while other types of quartz may be rose, yellow, green, blue, violet, brown, or black depending on the trace elements they contain.

The Livingston Hills are known to have both quartz veins and crystals. Some veins in the hills contain tourmaline and pyrite, two other minerals. Most of the quartz crystals found at Crystal Hill are either clear or milky white.

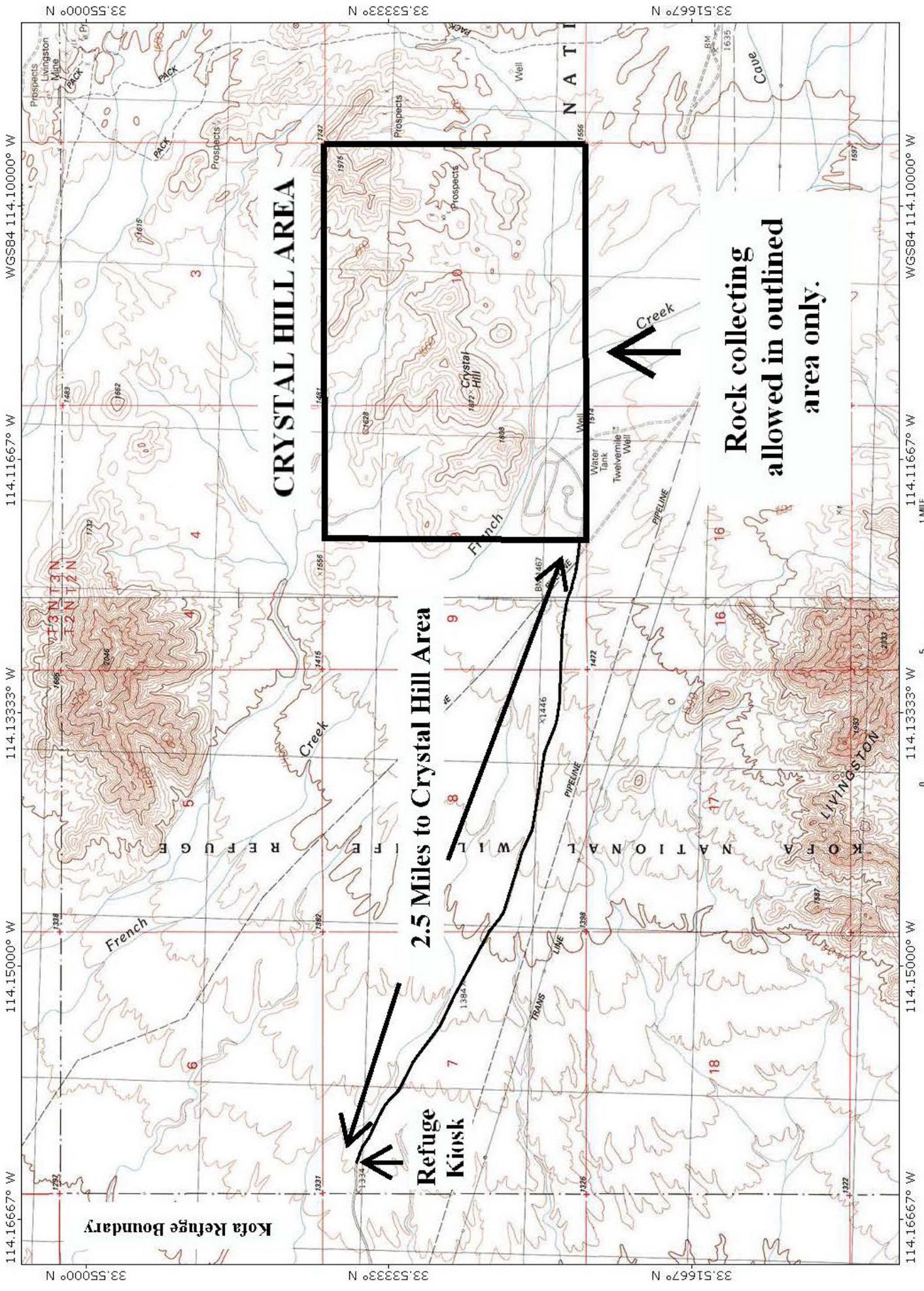
Rockhounding and Collecting on the Refuge

When searching for quartz crystals on the refuge, it is important to remember that recreational (noncommercial) rock or mineral collecting is not permitted beyond the boundaries of the Crystal Hill Area (see map). Collection of rocks is limited to 10 specimens or 10 pounds (whichever occurs first) in any 12-month period. Rock or mineral collection is limited to materials that are exposed and collectable without the use of tools, including metal detectors. Digging is prohibited. Please see the Kofa National Wildlife Refuge leaflet Public Use and Hunting Regulations for more information about regulations.

For Further Information

U.S. Fish and Wildlife Service
Kofa National Wildlife Refuge
9300 East 28th Street
Yuma, AZ 85365
928/783-7861
Monday–Friday: 8:00 a.m.–4:30 p.m.

February 2014



Kofa Refuge Boundary

Refuge Kiosk

2.5 Miles to Crystal Hill Area

CRYSTAL HILL AREA

Rock collecting allowed in outlined area only.



Map created with TOPO! © 2002 National Geographic (www.nationalgeographic.com/topo)