Geology & Cultural History of Ironwood Forest National Monument-IFNM, Southern Arizona

INFM Parameters
- **Established** 9 June 2000 - Exe. Order President W.J. Clinton
- **Land Management**: Bureau of Land Management
- **Footprint**: 188,619 acres (includes 59,922 acres non-federal lands, chiefly State Trust lands, and minor private holdings)
- **Cultural features**: 200+ Hohokam sites; historical mine-related sites
- **Current Uses**: Recreation, cattle grazing, mining on pre-existing mine sites
- **Threatened Species**: Ferruginous pygmy owl, desert bighorn sheep, lesser long-nosed bat, turk’s head cactus

Physiographic Features

Mining History
- Predominantly in the Silver Bell Mtns.
- Major Ore Deposit(s) type: porphyry copper
- Ore: copper, lead, zinc, molybdenum, gold

The IFNM surrounds and partially encompasses the Silver Bell metallic mineral district and either covers parts of or encompasses the Waterman, Magonigal and the Roskruge mineral districts. The most productive area has been the Silver Bell Mining District, where active mining continues to this day, immediately southwest of the monument, and by grandfather clause, on the monument proper.

The Silver Bell Mining District evolved from a collection of intermittent, poorly financed and managed underground mining operations in the late 1800s to mid-1900s struggling to make a profit from high grade ores; to a small but profitable producer, deploying innovative mining practices and advancements in technology to successfully develop the district’s large, low-grade copper resource (D. Briggs, 2017).

**Production in the Silver Bell Mining District** (Briggs, 2017)
Over the past 130 years, the Silver Bell mining district yielded approximately 2.27 billion pounds of copper, 6.6 million pounds of molybdenum, 3.7 million pounds of lead, 40.8 million pounds of zinc, 2,100 ounces of gold and 5.95 million ounces of silver. Copper mining adjacent to the IFNM continues today, with minor production of Mo, Pb, Zn, Au, and Ag.

Establishing what percent of production stems from the IFNM requires: 1) precise footprinting of mines; 2) assigning production values to properties on IFNM land.

Natural Resources Summary (5/2017)
Ironwood Forest National Monument

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Mineral Districts of eastern Pima County. Yellow highlighted districts are incorporated in part or entirely in IFNM (AZGS B-196, 1985).

The presence of gold ore in the Ragged Top Wilderness Study Area (WSA) of the Silver Bell Mountains was first announced by the US Geological Survey in Oct. 1988 (Spencer and Sawyer, 1988). A small gold rush ensued with 45 new lode mining claims.

**Concluding Statement**. With the creation of IFNP in 2000, exploration for additional copper mineralization was discontinued on the monument. Exploration continues to this day on mining claims on BLM lands in the Silver Bell Mtns.
Table 1. Silver Bell Mining District 1885-2015 (Unpbl data. Keith and Briggs). M=million, B=billion.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Period</th>
<th>Ore Treated</th>
<th>Cu (lbs)</th>
<th>Mo (lbs)</th>
<th>Pb (lbs)</th>
<th>Zn (lbs)</th>
<th>Au (oz)</th>
<th>Ag (oz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASARCO Open Pit</td>
<td>1954-2015</td>
<td>92M</td>
<td>2.2B</td>
<td>6.6M</td>
<td>2.5M</td>
<td>605</td>
<td>736</td>
<td>4.8M</td>
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<tr>
<td>Atlas (BS&amp;K)</td>
<td>1915-1964</td>
<td>147,548</td>
<td>3.4M</td>
<td>0</td>
<td>204,125</td>
<td>40.6M</td>
<td>677</td>
<td>64,866</td>
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<tr>
<td>El Tiro</td>
<td>1905-1930</td>
<td>201,668</td>
<td>21.3M</td>
<td>0</td>
<td>712,420</td>
<td>0</td>
<td>15</td>
<td>33,595</td>
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<tr>
<td>Imperial-Mammoth</td>
<td>1887-1930</td>
<td>1.1M</td>
<td>74.2M</td>
<td>0</td>
<td>166,554</td>
<td>150,835</td>
<td>139</td>
<td>1.0M</td>
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<td>Young America</td>
<td>1885-1918</td>
<td>4,146</td>
<td>0.9M</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>450</td>
<td>5,420</td>
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<tr>
<td>Other Producers</td>
<td>1916-1957</td>
<td>1,560</td>
<td>77,396</td>
<td>0</td>
<td>67,840</td>
<td>6,050</td>
<td>97</td>
<td>5,212</td>
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<tr>
<td>Total</td>
<td>1885-2015</td>
<td>93.4M</td>
<td>2.3B</td>
<td>6.6M</td>
<td>3.7M</td>
<td>40.8M</td>
<td>2,114</td>
<td>6.0M</td>
</tr>
</tbody>
</table>

Select Literature Resources

AZGS Publications at http://repository.azgs.az.gov


Niemuth, N.J. & K.A. Phillips (1992), Copper Oxide Resources, Arizona Department of Mines & Mineral Resources Open File Report 92-10: 12 (Table 1).


Compiled by FM Conway and PA Peartree