

## **Pothole Gardens**

Potholes trap sand and particles of organic matter as well as moisture, and over time enough soil may fill a pothole to enable plants to grow. Often the first growth to appear is biological soil crust, a lumpy, dark-brown crust that is a living community of simple plants—algae, moss, fungi, lichen and cyanobacteria. This crust helps keep the soil from eroding and enriches it with nitrogen and carbon. As the amount and quality of the soil increases, grasses, herbs, and eventually yucca and other larger plants, including small trees, can grow, creating "gardens" on the slickrock. Biological soil crust grows slowly and is very fragile. Walk on the trail or on rock to avoid trampling it.



Published by Canyonlands Natural History Association

In cooperation with Canyonlands National Park

Text by Canyonlands National Park staff.

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# Pothole Point

GUIDE

TRAIL

.6 mile (1km) Needles District CANYONLANDS NATIONAL PARI



#### What Is a Pothole?

The rock surface along Pothole Point Trail is composed of sand grains deposited by oceans and wind. Over millions of years these sand grains became cemented together to form the Cedar Mesa Sandstone. Because this rock is not uniform in the way it was laid down or in the strength of its cementing material, it has not eroded evenly. Depressions called "potholes" have formed. Once started, a pothole continues to grow larger. It becomes a trap for windblown sand grains and pebbles which scour the surface deeper. Rainwater, which normally contains a weak carbonic acid, collects in the depression and continues to dissolve the cementing material.

Temporary pools created by rainwater collecting in potholes are welcomed by birds, mammals and reptiles. Less obvious forms of life depend on this water too. When conditions are right, you can see a myriad of tiny creatures in the murky puddles.

## Pothole Etiquette

Enjoy watching pothole life from pool edges. Never put your fingers, hands or feet into the water. Each pothole is a complete ecosystem. Plants and animals spend their entire lives within this miniature world of water. Oils from human skin, lotions or sunscreen pollute these water sources and make them uninhabitable. Help protect these precious life-giving pools.

### **Pothole Life**

Pothole creatures have adapted to extended periods of dryness punctuated by brief wet periods. During hot, dry times of the year when ground surface temperatures may exceed 170°F (76°C), pothole life seems to cease; however, lying dormant within the cracked mud are hundreds of microscopic eggs that tolerate dryness well. Their hard, dark-colored shells protect them from intense sunlight and breakage. Although most pothole animals survive as eggs, a few, such as snails, are able to withstand dry periods as adults. By sealing themselves inside their shells, snails can avoid desiccation until the next rain.

Early spring and late summer usually bring rain to the desert and water to the potholes. Within hours eggs hatch and within days life becomes visible. Crustaceans, tadpoles, worms and insects coexist in a world bounded by the water's edge. Spadefoot and red-spotted toads seek potholes as sources of water for reproduction. Larger animals find relief from the heat in pothole water.

Water, however, is a fleeting resource in the desert. When rains cease, potholes

quickly dry. To survive, pothole inhabitants have developed numerous highly specialized adaptations. Most pothole organisms have accelerated reproductive cycles. Some lay eggs that hatch at staggered intervals, leaving a portion to lie in reserve in the event that hatched eggs are unable to mature before the pothole dries. Even with these survival mechanisms, the mortality rate for pothole creatures is high during dry years. Fortunately, without human disturbance, enough will live to repopulate the potholes.

1. Fairy shrimp

3. Mosquito larvae

2. Tadpoles

- np 6. Tadpole shrimp 7. Clam shrimp
  - 8. Gnat larvae



