



### Pothole "Gardens"

Potholes trap sand and particles of organic matter as well as moisture. Eventually enough soil may fill a pothole to enable plants to grow. Often the first growth to appear is "microbiotic soil," a lumpy dark brown crust which is actually a living community of simple plants (algae, fungus, lichens and moss) 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 larger plants such as yucca and small trees can grow, creating small "gardens" on the slickrock. Microbiotic soil is slow growing and very fragile. Walk on the trail or on rock to avoid trampling it.

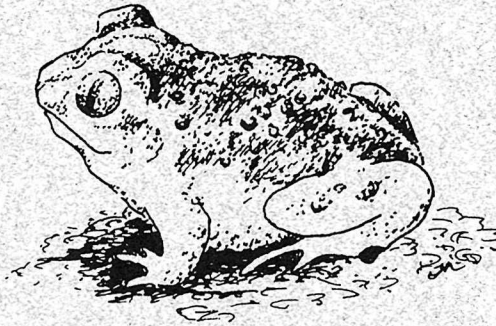


### Pothole Etiquette

Discovering a pothole after many miles of hot, dry hiking can be a real delight, or even a life-saving find. However, in using the water, consider that others, both human and animal, may depend on this same water for life. Therefore:

Use only what you absolutely need. Potholes do not replenish their water supply, and any water used will make the pothole dry up faster.

Never pollute a pothole. Dip water out of it with a clean cup or pot. Do not wash, wade or bathe in it.



**Great Basin Spadefoot Toad**  
(*Scaphiopus intermontanus*)



### Canyonlands National Park

125 West 200 South  
Moab, Utah 84532  
(801) 259-7164



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30 South 100 East  
Moab, Utah 84532  
(801) 259-6003

Text by Canyonlands National Park Staff



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# Pothole Point

Trail Guide

.6 mile



Needles District  
Canyonlands  
National Park



## What is a Pothole?

The rock surface across which you will be walking 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 hasn't eroded evenly. Depressions called "potholes" have formed.

A pothole, once started, continues to grow larger. It becomes a trap for windblown sand grains and pebbles which scour the surface deeper. Rain water, which normally contains a weak carbonic acid, collects in the depression and continues to dissolve the cementing material.

The pools created by potholes are welcomed by birds, bats and other small mammals. But other less obvious forms of life depend on this water too. If you look closely, you will discover a number of tiny creatures that live their entire lives in these miniature reservoirs.

## Pothole Life

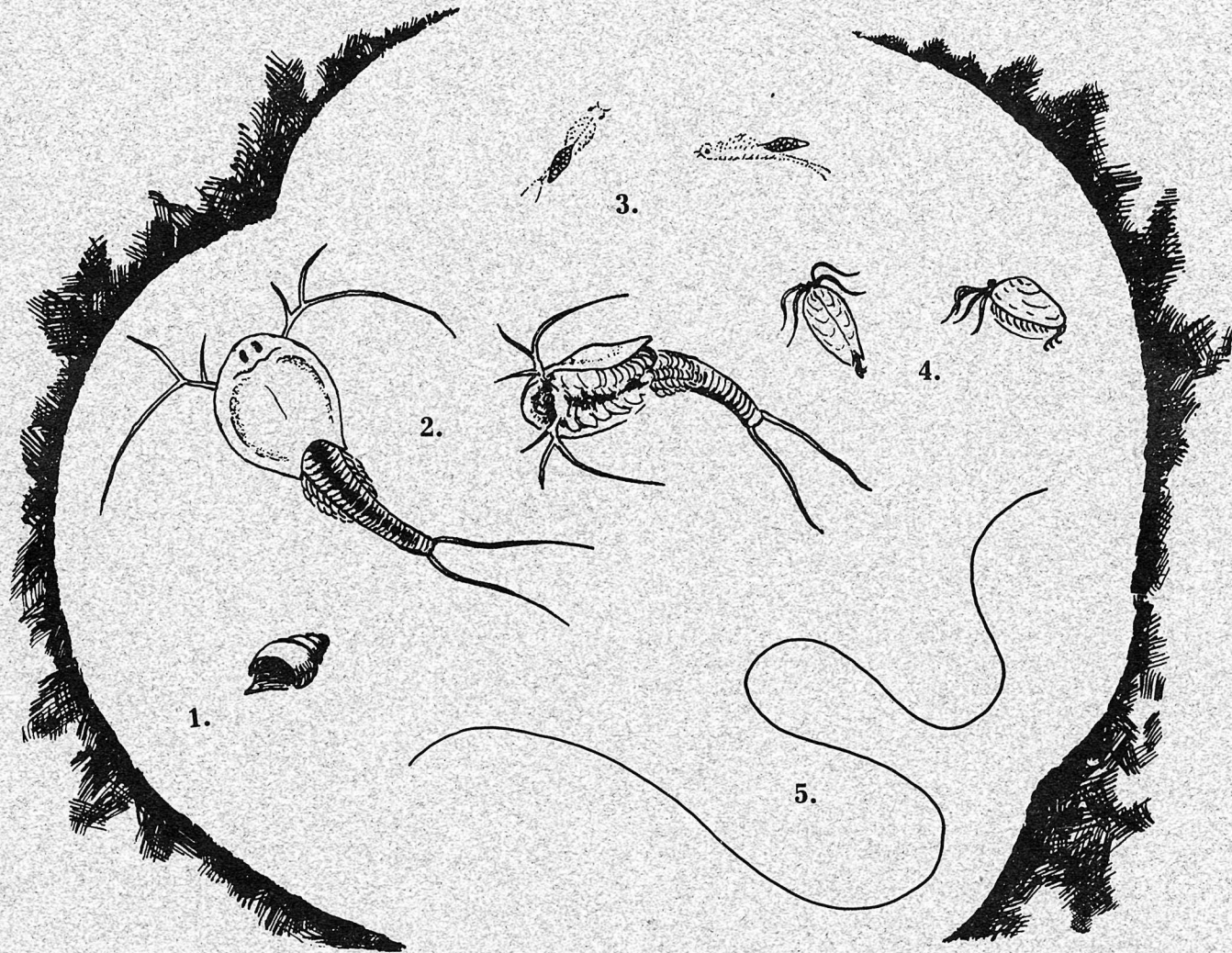
Pothole life has adapted to two extremes of the desert climate: wet and dry.

During hot, dry periods, when ground surface temperatures may reach up to 140 F (60 C.), pothole life seemingly ceases. Lying dormant, however, within the cracked mud of the pothole are hundreds of microscopic eggs, protected from the heat and dryness by unique adaptations. Most life found within dry potholes exists in this form, with embryos that can tolerate dryness. A few, such as the snail, are able to resist drying out and can survive dry periods as adults.

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

Relief, however, is often shortlived, as water is a temporary resource in the desert. To live in a pothole is to live a life of brevity, and requires adapting to periods of brief wetness and long dryness. Most forms of life have hastened their reproductive cycles; some lay eggs which hatch at different times, thus leaving a

reserve in case those that do hatch don't reach adulthood before the pothole dries. Even with these survival mechanisms, the mortality rate is high during dry years. With minimal disturbance, enough survive to ensure continuation of the species.



## Can you find these pothole dwellers?

1. Snail      2. Tadpole Shrimp      3. Fairy Shrimp  
4. Clam Shrimp      5. Horsehair Worm

(Drawings life-size)