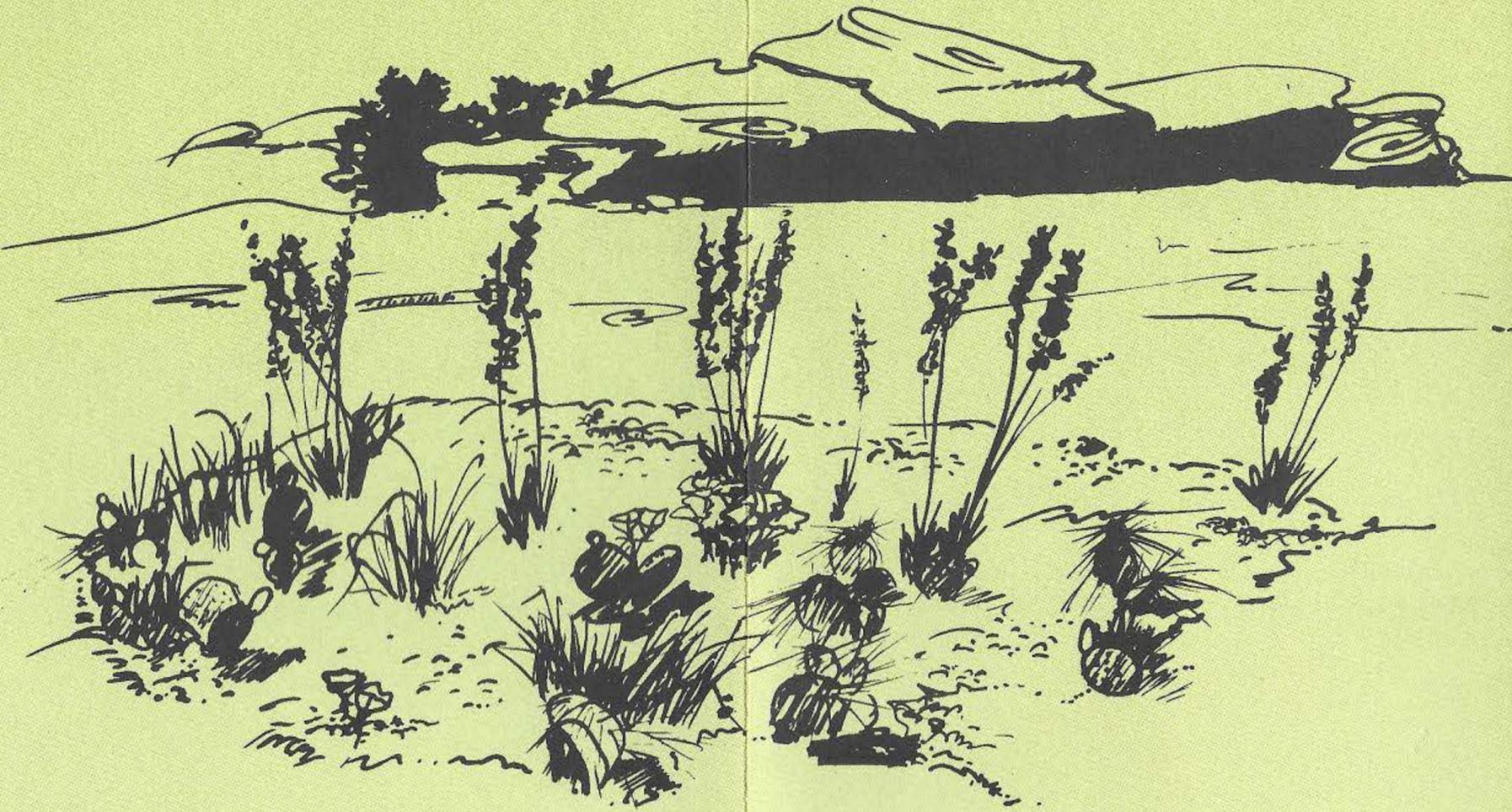


# Pothole Point

TRAIL GUIDE



## What's for dinner?

Largely confined to their puddle, pothole residents create a complex food web. Filter feeders eat algae and microscopic plants. Shrimp feast on bacteria, algae, and the remains of less successful life forms. The Great Basin spadefoot toad consumes up to half its body weight in insects and shrimp every night. Some pothole residents might become snacks for ravens or bats.

The desert may seem lifeless, but survival strategies evolved over time let organisms thrive in unlikely places. The climate here is rapidly getting hotter and drier. What might that mean for life in the potholes?

Canyonlands National Park protects the tenacious creatures that call this desert home and provides opportunities for us to learn from their stories. How might you adapt your “survival strategies” after exploring the potholes of Canyonlands?



National Park Service  
U.S. Department of the Interior

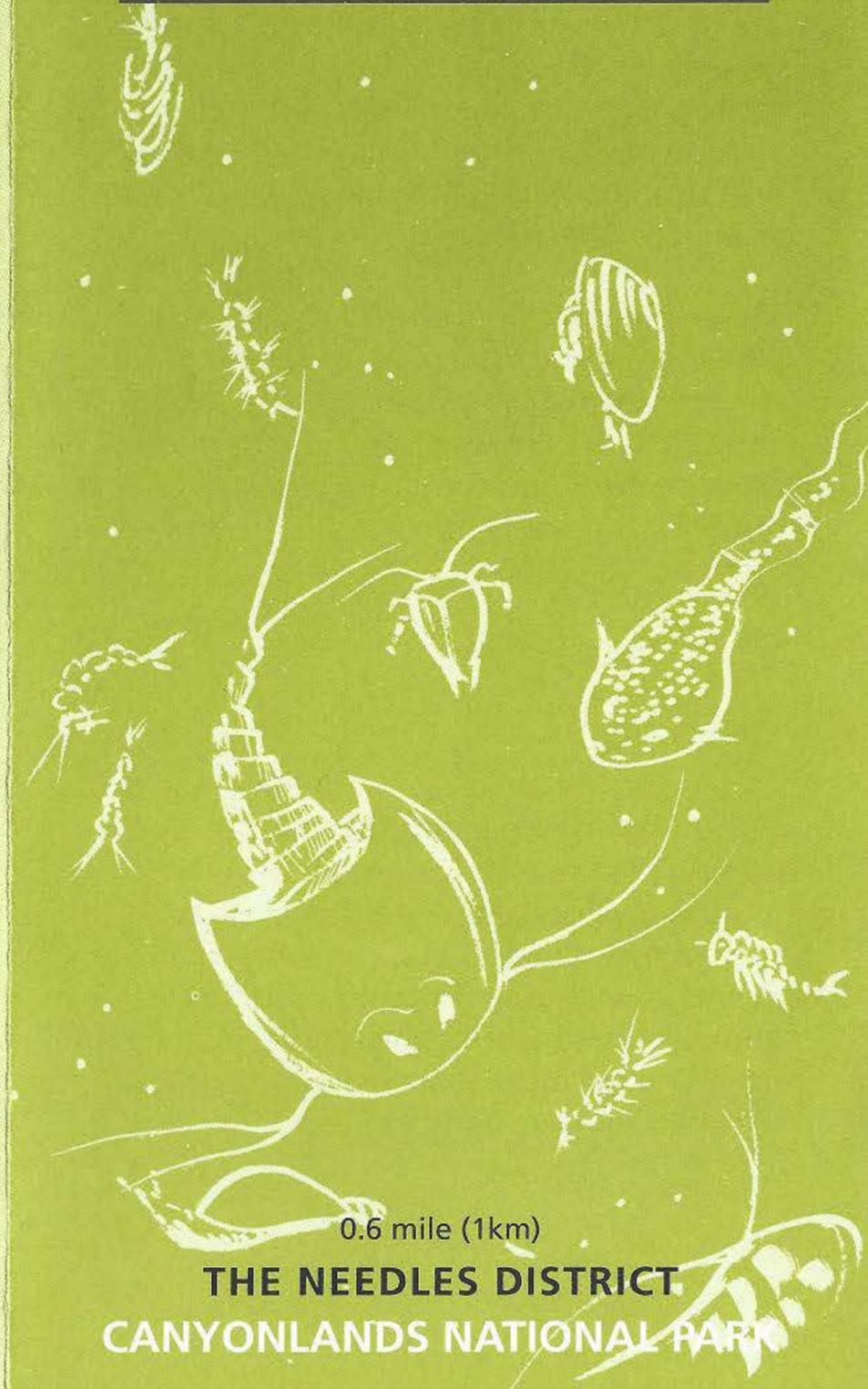
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EXPERIENCE YOUR AMERICA



0.6 mile (1km)

THE NEEDLES DISTRICT  
CANYONLANDS NATIONAL PARK

Deserts may seem lifeless, but look closer. Pinyon and juniper trees thrive here. Grasses spring up between rocks. Coyotes howl, ravens soar, and lizards bask in the sun. Even the puddles teem with tiny life. How does it survive?

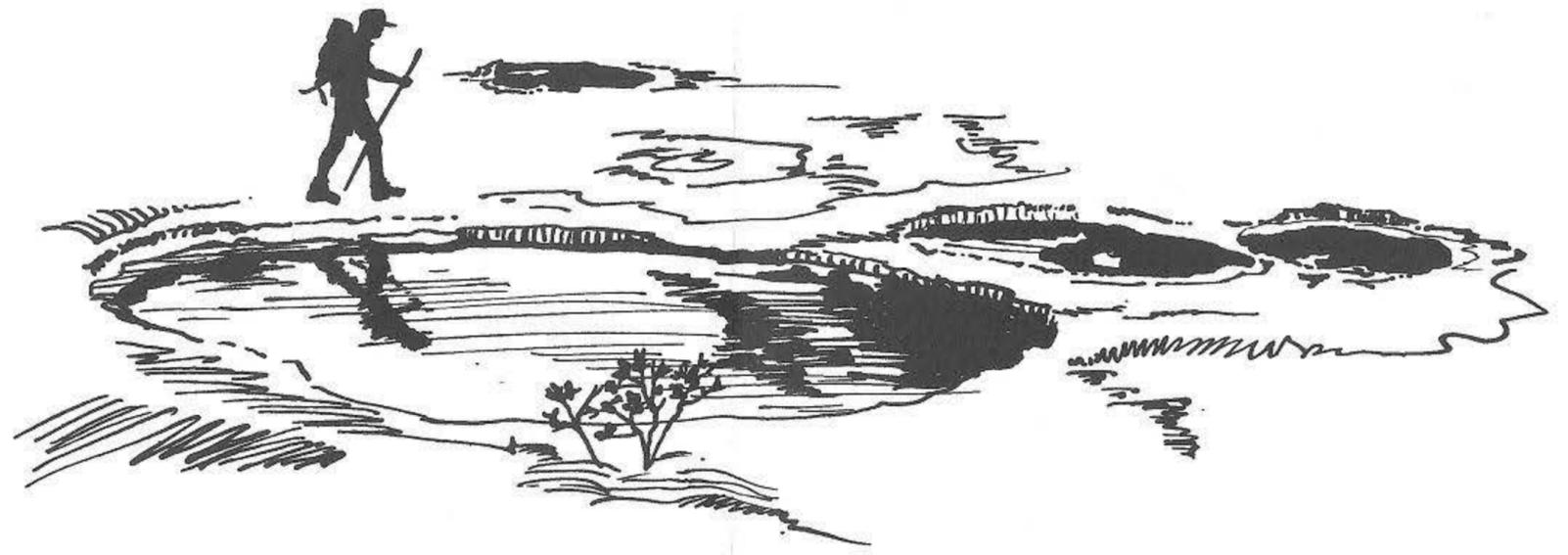
## Take a Walk on the Wild (and Rocky!) Side

This short loop trail crosses sandstone dimpled with pockets called potholes. When wet or dry, potholes are tiny—and sensitive—ecosystems. Body oils, soaps, and sunscreens easily pollute the water. Protect these ecosystems by never putting anything (like fingers or feet) into potholes, and by walking around potholes, even when they are dry.

The bumpy soil along the trail is also alive. Biological soil crusts are living communities of cyanobacteria, mosses, algae, lichens, and fungi. Soil crust prevents erosion, stores moisture, and provides critical nutrients for plants. Protect this life by staying on trail.

## How Do Potholes Form?

The sandstone along this trail has not eroded evenly. Weakly acidic rainwater collects in surface depressions and dissolves the rock's cementing material, making shallow depressions deeper. Microbes produce a thin film that lines the rock surface, keeping water from soaking into the sandstone. As water sits, an ecosystem comes to life.



## Escape, Tolerate, Resist

With rock temperatures up to 150°F (60°C) and only 7 to 9 inches (17-23 cm) of rain per year, which strategy would you use to survive?

- **Escapers** (mosquitoes, adult tadpole shrimp and fairy shrimp, spadefoot toads) cannot tolerate dehydration. For them, potholes are a convenient place to breed and lay drought-tolerant eggs.

- **Tolerators** (rotifers, shrimp eggs) can withstand an almost complete loss of body water. Microscopic tardigrades slow their metabolism to 0.1 percent of normal and form a waxy cyst to protect their remaining moisture. Some tolerators can rehydrate and become fully functional in as little as 30 minutes after it rains.

- **Resistors** (snails, mites) use a waterproof outer layer to prevent desiccation. Some have a shell or exoskeleton that prevents water loss, while others burrow and seal themselves in fine layers of mud.

When potholes dry out, life doesn't end—it hides. Within the cracked mud, hundreds of microscopic eggs might just be waiting for the next rain.

- |                           |                   |
|---------------------------|-------------------|
| 1. Fairy shrimp           | 6. Tadpole shrimp |
| 2. Tadpoles               | 7. Clam shrimp    |
| 3. Mosquito larvae        | 8. Gnat larvae    |
| 4. Snail                  |                   |
| 5. Beetle larva and adult |                   |

