

## **2008 Spring Snapshot Survey in the Mojave National Preserve**

**By Boris Poff and Annie Kearns**

The 2008 Spring Snapshot Survey was the fourth annual spring snapshot survey conducted in the Mojave National Preserve. It lasted from mid-September through late-November and was conducted with the help of five NPS employees and eight volunteers. A total of 175 springs and seeps were visited within the Preserve's boundary of which 102 were found to be wet and 73 did not have any significant moisture.

### **Background**

How much water is in Mojave National Preserve and how many springs and seeps are there? The answer varies depending on the time of year and also varies from year to year. Because spring recharge comes from local rain, late fall through late spring normally is the wettest time of year. Late spring through early summer usually has the least rainfall and flow at natural springs steadily decreases during this time. Late summer monsoons occasionally create wet conditions, but the unpredictability of monsoonal rains can mean that late summer through mid fall is the time of year with the least available surface water at Mojave springs. If a summer without a monsoon is followed by a winter drought, a whole year can go by without any measurable rainfall and ephemeral springs may begin to dry up.

In order to identify how much surface water is available during the driest time of the year Mojave National Preserve performs annual surveys of the springs and seeps, set to occur each fall. The goal of this project is to form a "snapshot" of the water supply during what is normally the time of year with the least available surface water.

Most springs in the 1.6 million-acre (647,500 ha) Mojave National Preserve are located in the Providence and New York Mountain ranges diagonally crossing the preserve. The exact number of springs and seeps varies depending on climatic conditions. From 2002 to 2004 most springs were inventoried and GPSed. To date, over 240 sites associated with naturally occurring water have been identified but more are occasionally still found. In wet years, such as 2005, water is found seeping from places that normally are not associated with water.

Late-summer monsoons in the preserve provide patchy rainfall coverage at best, but are most dependable along the spine of mountain chains from the Castle Peaks in the northeast to the Granites in the southwest. Of the spring and seep locations in Mojave National Preserve, all but probably two (MC Spring and Piute Spring) are mountain-front type springs discharging from perched aquifers that receive most of their recharge during the winter season. Thus they are unlikely to be affected by groundwater pumping from local basin aquifers. They are, however, sensitive to variable precipitation and like to go dry in a multiyear drought. These springs are the only natural water sources in a 1.6 million acre park for 321 bird and 50 mammal species.

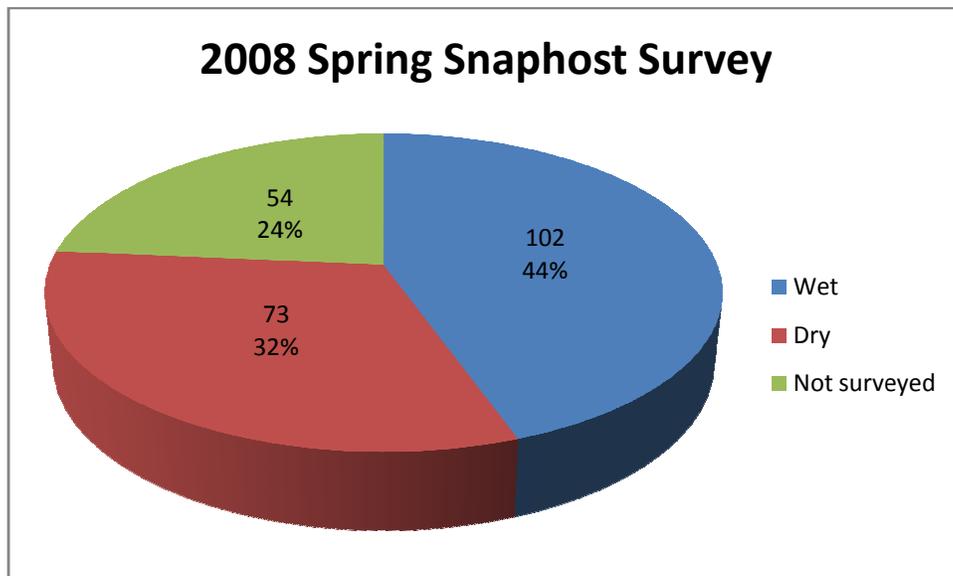
## Methods

The reporting criterion established for the 2005 survey was limited to one simple question called “The Wet Hand Test!” This method is as simple as it sounds: If the surveyor puts his/her hand down in the wettest place on the spring or seep, will the hand get wet or will it merely touch damp soil? Many animals are known to paw or stomp into wet ground in order to create a depression that fills with water from which they drink. Thus, even a small amount of surface water (enough to wet a hand) on soft ground can provide drinking water for wildlife.

Starting in 2006 additional information was gathered about the status of springs or seeps. The observations include critical updates not only about available water, but also about the presence of tamarisk, burros, and the amount of discharge.

## Results

This year only 13 people, both staff and volunteers, participated in the snapshot survey, this included a volunteer who dedicated himself full-time to this project, as well as one full-time employee enabling a much higher number of spring visits than in previous years. A total of 175 spring sites were surveyed from 9/13/2008 to 11/25/2008. The survey ended after the onset of the first fall/winter rain. The number of springs visited corresponds to 76% of the sites in the “Springs and Seeps” database at that time. Of these sites, 102 were reported wet (58%) and 73 were reported dry (44%) (see Figure 1).



**Figure 1: Breakdown of number & percentage of springs visited and how many of the visited springs were either wet or dry.**

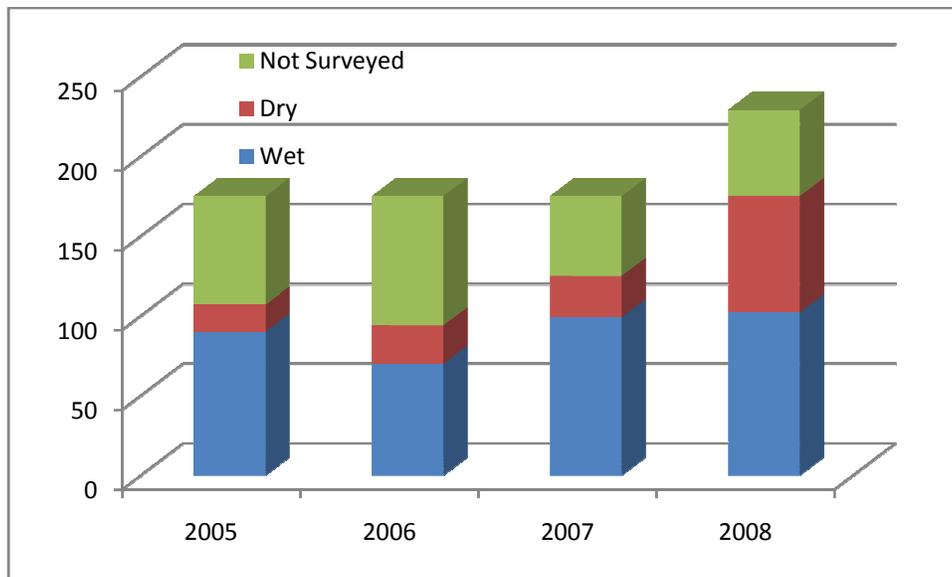
Table 1 shows a comparison of springs and seeps visited during the snapshot surveys from 2005-2008 plus a limited number of springs that were surveyed during the fall of 2004 and entered into the spring database at that time. The results listed in this table may differ from previously reported results due to database management and consolidation in 2008. The results given here

only reflect the number of actual springs visited during the survey and has eliminated duplicate reports (i.e. same springs [same GPS locations] visited by various people under different spring names), and records of “none spring” GPS points.

**Table 1: A comparison of spring snapshot survey plus spring visited by Tom Whittaker in the fall of 2004.**

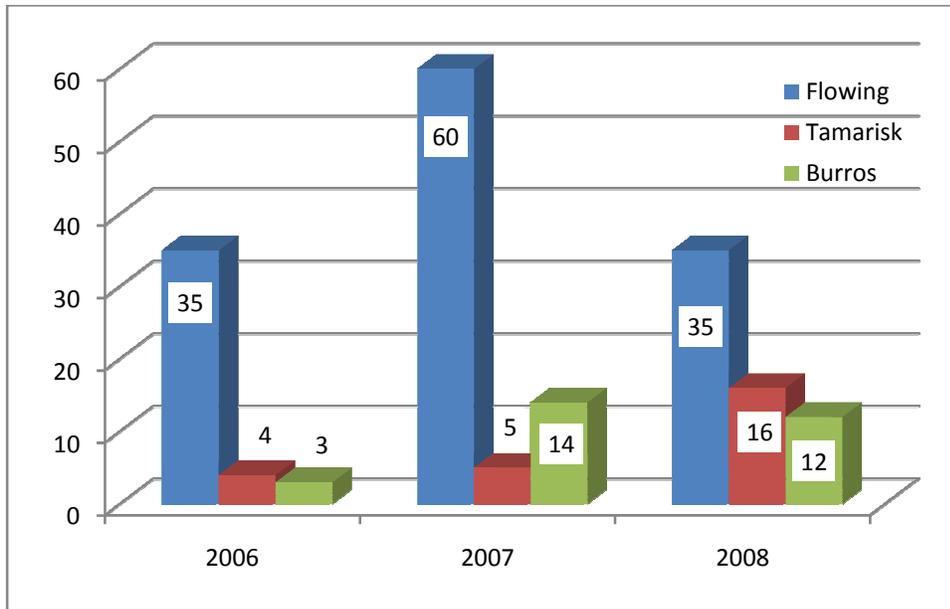
<b>Springs</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
in DB	62	175	175	175	229
Visited	58	107	94	125	175
Visited & Wet	40	90	70	99	102
Visited & Dry	18	17	24	26	73
% Wet of Visited	69	84	74	79	58

Figure 2 also provides a breakdown of the total number of springs in the adjusted “Springs and Seeps” database for each year the spring snapshot survey was conducted (2005-2008) and whether surveyed springs passed or failed the “wet hand test.”



**Figure 2: Total number of springs in the springs and seeps database, broken down by the number of springs (not) surveyed and whether they passed or failed the wet hand test.**

Figure 3 provides an overview of some of the additional information on the surveyed springs that was collected starting in 2006. This information includes the number of the springs that passed the wet hand test and actually had a measureable discharge, which was 50, 61 and 34 percent, respectively, for the past three years. Given is also the number of springs which either had tamarisk growing in their vicinity or showed evidence of recent burro activities.



**Figure 3: Number of surveyed springs with actual flow, tamarisk and signs of burro usage.**

### **Acknowledgements**

Special thanks to all the volunteers who participated in the 2008 spring snapshot survey (Aaron Gallagher, Tim Griffith, Nate and Dan Booth, Jim McGee, David Yankowich, Brian Davis & Victoria Henderson) as well as NPS staff members David Nichols, Jeanne Taylor and Jason Dungan, who all contributed to the great success of this survey.