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Lake Mead National Recreation Area Vegetation Monitoring and Analysis: Quarterly Progress Report, April 1, 2009 to June 30, 2009

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QUARTERLY PROGRESS REPORT

University of Nevada, Las Vegas

Time Period: April 1, 2009 to June 30, 2009

Cooperative Agreement Number H8R07060001

Task Agreement Number J8R07060011

Lake Mead National Recreation Area

Vegetation Monitoring and Analysis

Executive Summary

- The Weed Sentry program surveyed over 187 miles (1,342 acres) of federal land by vehicle and foot in Clark County for incipient populations of exotic plants.
- Weed Sentry staff continue to survey never before surveyed sites, and trails and regions within Upper Las Vegas Wash CTA and Sloan Canyon NCA as requested by BLM managers.
- In 2009 rare plant monitoring was completed. Data entry and analysis are in progress.

Program Activities

The task agreement was awarded to UNLV on October 1, 2006. This report covers the period April 1, 2009 to June 30, 2009. The following activities have been conducted toward meeting or exceeding deliverables in the statement of work.

Invasive Plant Monitoring and Treatment (Weed Sentry Program)

Research assistants in the Weed Sentry Program are tasked with mapping and treating incipient populations of exotic species on targeted federal lands throughout Clark County. Surveying activities for invasive species that took place from April 1, to June 30, 2009, are divided into sections by federal agency, and are summarized in Tables 1-4. More than 187 miles and 1,342 acres were surveyed for exotic, invasive species during this period.

Table 1. Summary of miles and acres surveyed, Weed Sentry Program, April 1, 2009- June 30, 2009, by federal agency.

Agency	Miles	Acres
National Park Service	35	276
Bureau of Land Management	80	494
Forest Service	0	0
Fish and Wildlife Service	72	572
Total	187	1342

A. *Locations surveyed: National Park Service*

Vehicle surveys were conducted along the Muddy River Access Road, Tassi Wash Road and the old Pierce Ferry overlook campground.

NPS surveys were conducted by foot in the following locations: entrance to Government Wash, trail at the end of Muddy River Access Road, Summit Trail and nearby washes, Redstone Picnic area and parking lot, washes at mile marker 28 on Northshore Drive, Pierce Ferry shoreline, South Cove shoreline, and the Tassi Springs area.

B. Locations surveyed: Bureau of Land Management

BLM surveys were conducted by automobile at the following locations: Jean Dry Lake roads, Jean Railroad roads, Red Rock NCA campground and the roads west of Walking Box Ranch Road.

BLM surveys were conducted by foot in the following locations: Loop Trail and the Loop Drive from the Sandstone Quarry pull-off to White Rock pull-off (Red Rock NCA), Calico Tanks Trail (Red Rock NCA), washes at the end of Durango Road and Decatur Road (Upper Las Vegas Wash CTA), and north Sloan Canyon NCA. Additionally, we revisited the area where puncturevine was recorded along the Pine Creek Trail (Red Rock NCA) and Willow Springs Picnic Area (Red Rock NCA) to check for newly visible infestations since earlier surveys.

C. Locations surveyed: Forest Service

No surveys were conducted on Forest Service land during this quarter.

D. Locations surveyed: Fish and Wildlife Service

At Desert National Wildlife Refuge, vehicle surveys of Gass Peak Road, Mormon Well Road and Sawmill Trail Road were conducted. An unnamed pack-trail south of Elbow Canyon, backcountry areas west of Hwy 93, and Sawmill Trail were surveyed by foot.

E. Small incipient population treatment

In addition to surveying, the Weed Sentry staff are tasked with treating upon discovery (often hand pulling) small, incipient populations of invasive plants. This represents a pro-active effort to remove invasive species before they become larger infestations and, therefore, increasingly costly and difficult to eradicate. During the third quarter of 2009, a total of 4,498 individual invasive plants were removed by Weed Sentry staff from federal lands in Clark County.

Table 2. Number of individual invasive plants removed, Weed Sentry Program, April 1, 2009 – June 30, 2009, National Park Service lands.

Species	Number of individuals
<i>Brassica tournefortii</i>	105
<i>Bromus diandrus</i>	332
<i>Hordeum murinum</i>	104

<i>Malcolmia Africana</i>	637
<i>Sisymbrium irio</i>	107
<i>Tamarix ramosissima</i>	5
Total	1290

Table 3. Number of individual invasive plants removed, Weed Sentry Program, April 1, 2009 – June 30, 2009, Bureau of Land Management lands.

Species	Number of individuals
<i>Brassica tournefortii</i>	69
<i>Bromus diandrus</i>	910
<i>Chorispota tenella</i>	210
<i>Descurania Sophia</i>	199
<i>Halogeton glomeratus</i>	21
<i>Hordeum marinum</i>	237
<i>Malcolmia Africana</i>	81
<i>Salsola tragus</i>	48
<i>Sisymbrium spp.</i>	336
<i>Triticum aestivum</i>	2
Total	2113

Table 4. Number of individual invasive plants removed, Weed Sentry Program, April 1, 2009 – June 30, 2009, Fish and Wildlife lands.

Species	Number of individuals
<i>Hordeum murinum</i>	43
<i>Malcolmia Africana</i>	1052
Total	1095

Sahara Mustard Research

D. Bangle and J. Craig completed data collection on the manipulative field experiment, which tested the effect of the timing of weed whacking on *Brassica tournefortii* re-growth and seed production. Data are being analyzed and will be discussed in the next quarterly report.

D. Bangle and A. Suazo initiated research on seed longevity in *Brassica tournefortii*. We will be looking at how depth of seed burial (5 different depths) affects seed mortality and germination over time (10 different time periods). Progress to date includes, building of seed cages (with the assistance of NCC crews and LMNRA volunteer events), holes dug and cages installed at three of the four sites, *B. tournefortii* seed has been collected from each site, and soil sifting has begun.

A. Suazo initiated a seed granivory study to document the effects of native ants and rodents on Sahara mustard seed. Preliminary results show that harvester ants remove a substantial amount of seed. Data collection will continue during quarter three.

Rare Plant Monitoring and Research

A. *Monitoring*

Astragalus geyeri var. *triquetrus*

Threecorner milkvetch monitoring was completed this quarter. Three sites (Sandy Cove, Ebony Cove, and Weiser Wash) were included in the monitoring project. Four additional sites on BLM lands were surveyed for possible inclusion to the monitoring project, but so few individual threecorner milkvetch plants were found that the sites were deemed unsuitable for monitoring until more extensive surveys (by the BLM) covering more area can be completed.

Eriogonum viscidulum

Sticky buckwheat monitoring at Lime Cove and Glory Hole was completed this quarter. We did not add additional sites because no additional surveys on BLM lands took place, plus complications with the monitoring methods for this species arose. Discussions about the future of this design between appropriate participants is advised before monitoring continues with this species.

Arctomecon californica

Las Vegas bearpoppy monitoring was completed this quarter. Data collection from the six monitored populations are being entered into a database for analysis.

Anulocaulis leiosolenus var. *leiosolenus*

Ringstem monitoring was completed this quarter. Data collection from the three monitored populations are being entered into a database for analysis.

Other

D. Bangle participated in two conference calls with Rob Sutter (The Nature Conservancy) and Sonja Kokos (Clark County) on June 15 and 18 to complete final report for the county which includes the current rare plant monitoring protocols. The report is titled "Improving the Implementation of Ecological Monitoring and Adaptive Management in the Clark County Multiple Species Habitat Conservation Plan."

D. Bangle and C. Engel initiated a third season of data collection on ringstem phenology this quarter. Minor changes were made to the methodology in order to better estimate fruit production in this species.

B. *Herbarium and Native Plants*

This quarter, plant identifications occurred consistently. Plants were keyed as necessary for all vegetation programs including Weed Sentry, Nursery, Botany and Wildlife divisions. Herbarium assistant (Michelle Pardinas) began working additional hours in the herbarium to assist D. Bangle with processing the back-logged specimens.

Rain and temp/Rh data are being collected at all rare plant monitoring sites and baseline analyses will be reported next quarter.

Technical Assistance/Synergistic Work

A. Northshore Road Realignment Restoration Projects

In early June, landscape contouring and topsoil reapplication began at the Echo Wash site along Northshore Road. The Federal Highway Administration and the National Park Service are monitoring the topsoil reapplication. Once contouring and topsoil reapplication is completed at all three construction sites, monitoring plots will be established. Replanting salvaged plants as treatments is scheduled for October 2009.

Salvage plants from the Northshore Road construction areas were moved April 12, 2009 from the Overton Beach make-shift nursery to the Lake Mead Nursery due to the lowering lake level. There was a loss of about 100 plants since the move. Currently, the salvage plants are being watered twice daily by drip irrigation.

Perennial plant surveys at the three construction sites along Northshore Rd have been completed. This data will provide a baseline for perennial plant diversity and density, crust cover, and desert pavement cover.

Salvaged soil crusts are currently in storage and are being monitored bi-monthly. Temperature probes are monitoring soil and air temperatures within the storage unit.

B. Closed Road Recovery Monitoring-AR 108

In 2002, AR108 was closed for restoration. Portions of the road were ripped or left untouched. In April 2009, permanent monitoring plots were established to compare the recovery within these treatments with undisturbed sites close to the road. Ripped and not ripped plots were paired with undisturbed plots. Cover measurements were taken on all plants, biological soil crusts and desert pavement. This data will provide information on recovery of plant and soil communities.

C. Clark County Desert Burn Succession

Sampling plant community composition historical burns continued this quarter with most of the focus applied to locating older burns. Seven fires were sampled this quarter, ranging in age from 16 – 30 years.

D. Other

- J. Craig compiled and produced issue 2(2) of Mojave Applied Ecology Notes, a regional newsletter to communicate to collaborating agencies about research we are conducting. S. Abella, D. Bangle and C. Engel contributed.

Papers Published/In Press

- Abella, S.R., and J.D. Springer. 2009. Planting trials in northern Arizona ponderosa pine forests. *Ecological Restoration* (in press).
- Abella, S.R. 2009. Post-fire plant recovery in the Mojave and Sonoran Deserts of western North America. *Journal of Arid Environments* 73:699-707.
- Abella, S.R. 2009. Smoke-cued emergence in plant species of ponderosa pine forests: contrasting greenhouse and field results. *Fire Ecology* 5:22-37.
- Abella, S.R., J.L. Gunn, M.L. Daniels, J.D. Springer, and S.E. Nyoka. 2009. Using a diverse seed mix to establish native plants on a Sonoran Desert burn. *Native Plants Journal* 10:21-31.

Outreach/popular pubs

- Springer, J., and S. Abella. 2009. Using a diverse seed mix to establish native plants on a Sonoran Desert burn. *The Plant Press* 33(1):16-17. Arizona Native Plant Society, Tucson, AZ.
- Abella, S. 2009. Synthesis Completed of Post-Fire Recovery of Native Perennials in the Mojave, Sonoran Deserts. *Mojave Applied Ecology Notes* 2(2).
- Bangle, D., C. Engel. 2009. Documenting reproductive phenology and pollinator identities for rare plant *Anulocaulis leiosolenus* var. *leiosolenus* (southwestern ringstem). *Mojave Applied Ecology Notes* 2(2).
- Sutter, R., S. Kokos, and D. Bangle. 2009. "Improving the Implementation of Ecological Monitoring and Adaptive Management in the Clark County Multiple Species Habitat Conservation Plan" Final Report for Contract 2005-TNC-574F-P between Clark County and The Nature Conservancy.

Synergistic

- S. Abella was a proposal reviewer for the Department of Defense, Strategic Environmental Research and Development (SERDP).
- S. Abella was a proposal reviewer for the National Science Foundation.
- S. Abella was a reviewer for *Ecological Restoration, Journal of the Arizona-Nevada Academy of Science*.

Presentations

- Abella, S.R., E.C. Engel, D.J. Craig, and A.A. Suazo. Post-fire plant recovery and restoration: a systematic review and Clark County chronosequence. Oral presentation (invited) at the 10th annual meeting of the Eastern Nevada Landscape Coalition, Fire rehab in the 21st century: the Southern Nevada Complex, anomaly or the new status quo? Ely, NV. 13 June 2009.
- Abella, S.R., E.C. Engel, D.J. Craig, and A.A. Suazo. Update on completed and ongoing fire projects by UNLV. Oral presentation (invited) to resource managers of the Mojave Desert Initiative, Interagency Office, Las Vegas, NV. 7 May 2009.
- J. Craig spoke at the Succulent Society Meeting on May 4th, 2009 about the passive integrated transmitters used by Lake Mead to prevent cactus poaching.

- Engel, E.C., S.R. Abella, D. Craig. Seeding effectiveness and natural regeneration of Mojave desert plant communities. Oral presentation (invited) to the Nevada Native Plant Society. Henderson, NV. 4 May 2009.
- Abella, S.R. Fire and climate change in American Southwest arid lands. Oral presentation (invited) at the Environmental Biology Seminar Series, University of Nevada Las Vegas, Las Vegas, NV. 23 April 2009.
- Abella, S.R. Overview of restoration ecology, with examples from arid lands and the tropics. Guest lecture for ENV 205 [Environment and Development] class, University of Nevada Las Vegas, Las Vegas, NV. 1 April 2009.
- Smith, S.D., and S.R. Abella. Potential effects of climate change on ecosystem restoration in arid lands. Oral presentation (invited) at the 2009 annual meeting of the Association of American Geographers, Las Vegas, NV. 24 March 2009.

Agency Meetings/Training Attended/Professional Development

- J. Craig attended Southern Nevada Restoration Team Meeting on May 28, 2009.
- S. Abella, C. Engel, and A. Suazo attended the Mojave Desert Initiative meeting on May 7, 2009.
- S. Abella and C. Engel attended the conference “Fire Rehab in the 21st Century: The Southern Nevada Complex, Anomaly or the New Status Quo?” sponsored by the Eastern Nevada Landscape Coalition. June 12-13, 2009. Ely, NV.

Submitted by:



Margaret N. Rees, Principal Investigator

7/1/09

Date