

FY2011

VCNP Annual FY Visitor Summary Report



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Executive Summary

During the 2011, the Valles Caldera Trust moved forward in developing and implementing a more rigorous and defensible visitor counting system. This counting program was implemented in an attempt to be consistent with other public land agencies and their visitor counting techniques. Using advanced counters at 6 locations, and working in consultation with a National Park Service statistician, the number of visitors at the VCNP during FY2011 is reasonably estimated to be 97,552.

Introduction

The Valles Caldera Trust was created by the Valles Caldera Preservation Act of 2000 to preserve and protect the historic Baca Ranch of New Mexico's Jemez Mountains. The groundbreaking legislation that provided for the federal purchase of this 89,000-acre ranch nestled inside a volcanic caldera also created a unique experiment in public land management.

Keeping track of visitor numbers is a critical tool in both planning and managing a public resource such as the VCNP. In the 2010 Report to Congress, the VCNP trust set a goal to "implement a visitor counting system similar to what is used by other public land agencies". Prior to 2011, visitor totals on the Preserve were calculated by counting actual visitors who participate in an activity or who signed in at one of our two staging areas. However, it was determined that the Trust might be undercounting visitors, hence staff moved forward in developing and implementing a more rigorous and defensible counting system. The goal was to have a program that was more in line

with other public land agencies. Bringing the visitor counting system on par with other public land management agencies will assure a reasonable comparison of visitor counts with other public lands and ultimately allow a better analysis of visitation patterns.

Materials and Methods

After doing a market analysis on available counting systems, Trust staff purchased advanced counters manufactured by TRAFx Research Ltd. A TRAFx system consists of state-of-the-art hardware and software to collect, retrieve, analyze, manage, store and share data. The Trust purchased two types of counters: vehicle counters and infrared trail counters. These were employed starting in January of 2011.

TRAFx products are used by government agencies and research institutions in the US, Canada, Australia and Europe for parks and public lands management, recreation studies, traffic and transportation studies, and visitor studies.

There were several features of the TRAFx devices that made them suitable for use on the Preserve:

- Advanced Microelectronic Design
- Install at Roadside, Above or Below Ground
- High-Quality Infrared Scope on trail counter
- Self-Contained Design, no External Wires or Tubes
- Ideal for Rural, Rugged and Remote Roads
- Use as Permanent or Portable Counter
- Very Small and Easy to Hide — Reduces Vandalism Risk
- Low Operating, Maintenance, and Installation Costs
- Long Battery Life (approx. 1 year)
- Large Memory Capacity (store > 400 million counts)
- Field-Proven, Generation III Design (10 year history)

Vehicle Counter: This innovative, reliable, compact vehicle counter (Figure 1) uses a tiny magnetometer and advanced embedded software to detect passing vehicles. Passenger cars can be counted from up to 20 feet away, allowing coverage of two lanes from a roadside installation. Furthermore, the counter's detection range is user-programmable, and can be adjusted for single lane or two lane counting.

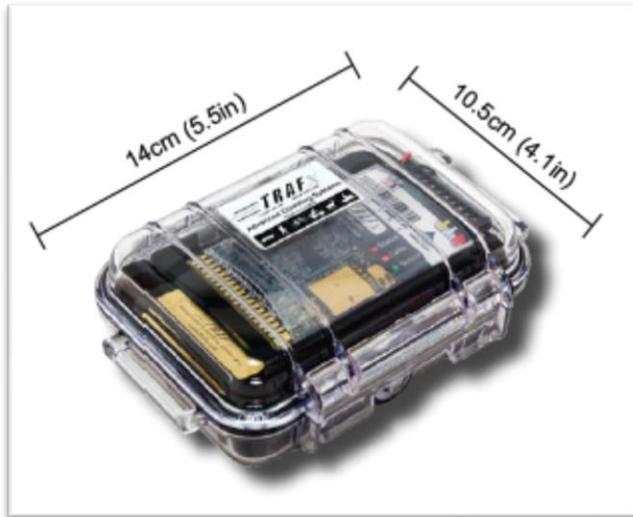


Figure 1. TRAFx Vehicle Counter

Specifications of the traffic counter include:

CASE: 14cm x 10.5cm x 5cm (5.5in x 4.1in x 2in); weatherproof

WEIGHT: 250g (8.8oz) (without batteries)

POWER: "C size" batteries; alkaline (e.g., Duracell) or lithium

BATTERY LIFE: 12 to 14 months max. with three alkalines 36 months max. with one lithium

DETECTION RANGE: 6m (20ft) max. for most passenger vehicles

DATA TYPE: ASCII; .TXT file type

DIGITAL MEMORY DESIGN: Data and settings are retained even when batteries are replaced or die

TIME KEEPING: Quartz clock; 20ppm accuracy

OPERATING TEMPERATURE: -40C (-40F) to +70C (158F)

SENSOR TYPE: Low-field geomagnetic; 14-bit resolution

COMMUNICATIONS: RS232 serial; 115,000 baud

OTHER: Gold-plated PCB; silicon conformal protected electronics; electrostatic discharge protection; short circuit protection; RoHS (leadfree)

Trail Counter: The TRAFx Infrared Trail Counter (Figure 2) is designed to count general traffic on trails and paths. Unlike most infrared trail counters, it does not require a receiving unit or reflector to operate. This results in a very compact, easy-to-hide design, which reduces risk of vandalism. Using a small, high-quality infrared scope mounted on a tree and pointed towards the trail, the Trail Counter detects and counts the infrared signature associated with warm, moving objects.



Figure 2. TRAFx infrared Trail Counter

Specifications of the trail counter include:

CASE: 11cm x 7cm x 3cm (4.3in x 2.8in x 1.2in); weatherproof

TOTAL WEIGHT: 170g (6oz) (without batteries)

CABLE: 1m (3.3ft)

POWER: Three "AA size" alkaline batteries (e.g., Duracells)

BATTERY LIFE: Approx. 3 years

DIGITAL MEMORY DESIGN: Data and settings are retained even when batteries are removed

TIME KEEPING: Quartz clock; 20ppm accuracy

OPERATING TEMPERATURE: -40C (-40F) to +50C (122F)

SENSOR TYPE: Thermal infrared microsensor

DETECTION RANGE: 6m (20ft)

COMMUNICATIONS: RS232 serial; 115,000 baud

DATA TYPE: ASCII; .TXT file type

OTHER: Gold-plated PCB; silicon conformal protected electronics;

Consultation with National Park Service: Trust staff consulted with National Park Service statistician Mr. Butch Street. Mr. Street works for the Public Use Statistics Office, which is located in the Social Science Division under the Office of the Associate Director for Natural Resource Stewardship and Science. The Public Use Statistics Office manages a program for collecting, auditing, and analyzing visitation data that are provided by individual National Park System units on a monthly basis. Mr. Street was most helpful in helping design a VCNP specific counting program, providing tips on eliminating counting errors and misinterpretations, and in final data analysis.

Implementation of Counting Program: The VCNP visitor counting program was implemented based on a set of key points. These included:

1. Calibration of counters to their location is critical. We will follow NPS recommendations for random surveys both am and pm for one hour, 6 times per month, at three month intervals to determine accuracy of counters (Appendix A).
2. Calibration should occur at different times of the day/year to determine the effects of different traffic patterns on counting accuracy. All counters will be calibrated to insure no one is double counted, establish an error factor, develop a person per vehicle multiplier, and determine non-reportable percentages (Appendix B).
3. Counter accuracy is affected by both how the counter is installed, and how traffic behaves at the installed location. We will pay close attention to this fact.
4. Once snow conditions allow, G3 magnetic vehicle counter will be placed at 8 locations: Highway 4 east, Highway 4 west, Highway 4 east pullout, Highway 4 west pullout, Valles Caldera main gate, Banco Bonito gate, Redondo gate, and Sulphur gate. These will be kept in place until season patterns become apparent and our counters can be done on a more seasonal basis.

5. Side-oriented infrared counters will be placed at Coyote Call and Valles Caldera trail entrances since these are best suited in narrow locations where people cannot walk side-by-side.
6. Active infrared sensors can be sensitive to environmental factors (heavy rain or snow, mist, waving branches in front of the beam, etc.), so will be placed accordingly.
7. Counters should be placed at locations that are representative of visitor behaviors, based on VCNP staff knowledge of the area.
8. Installations should be discrete. Vandalism of counters can be expensive and time consuming.
9. Staff should be adequately trained and have a vested interest in counting program success. This generally leads to more reliable and accurate results.
10. Data will be collected before batteries are low and as often as is reasonable based on staffing availability

Results

Raw data were downloaded from the counters on an intermittent basis throughout the year. While there were occasional issues with the counters (batteries, moisture, and fire damage) the counters collected ample data to give a reasonable estimate of the number of visitors. While we had 10 counters deployed, we opted to use information from only 6 counters in our final estimates of visitors. The other 4 (highway 4 traffic and highway 4 pullouts) will be used for planning purposes and not in our total estimates of visitors. However, it is noteworthy that we had an estimated 123,701 visitors to the Highway 4 east pull-out, and 36,910 visitors to the Highway 4 west pull-out for calendar year 2011.

The raw data were analyzed using the following methodology and assumptions:

- The total numbers on each counter at a gate data were divided in half to avoid double counting (everyone comes and goes through a gate).
- Person per Vehicle Multiplier = 2.60333 based on 9 surveys, which was applied to each individual vehicle count.
- Pull-out and highway data were not used in total visitor count estimates; this included an estimated 123,701 visitors to the Highway 4 east pull-out and 36,910 visitors to the Highway 4 west pull-out during calendar year 2011.
- No adjustments were needed to avoid double counting on trails (based on the 9 surveys). Trails were counted while open April-June of this year.
- Banco, Redondo, and Sulphur gate do not have visitors Jan, Feb, and March due to snow.
- Fire camp counts were removed from Redondo gate June-27-July 12 as an outlier as to not impact AADV.
- Preserve considered closed during above fire dates, so those predicted totals removed when figuring actual totals. Hence:
 - Main Gate counts removed June 27-July 13, due to fire as an outlier to not impact AADV.
 - Pull-out counts removed June 27-July 6, due to fire as an outlier to not impact AADV.
- Non-Reportables: Employees account for estimated 50 vehicles per day on Preserve (50 multiplied by 2.60333) through gates = 130.165 removed per day. Multiplied by 365 days per year, equates to 27,375 non-reportables removed from total count.

Table 1 shows the final estimates of visitors on a per month basis.

Valles Caldera National Preserve FY11 Visitation Estimates

Site	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	AADV†	Days with data	Adjusted Totalst††
<i>VCNP Main Gate</i>	8,393*	8,122*	8,393*	2,763*	1,584*	3,190*	3,946	6,684*	7,118	8,241*	10,527	12,620	270.747	182	81,581
<i>Redondo Gate</i>	1,560*	1,509*	0	0	0	0	978*	807	2,228*	1,030*	1,469	966	50.318	148	10,546
<i>Banco Gate</i>	2,478*	2,399*	0	0	0	0	1,836*	1,871	5,286	958	1,562	1,921	79.964	168	18,311
<i>Sulphur Gate</i>	493*	477*	0	0	0	0	130*	328	507	583	409	651	15.902	164	3,578
<i>Coyote Call Trail</i>	869*	841*	869*	869*	785*	869*	841*	1,082*	718	0	0	0	28.042	48	7,743
<i>Valle Grande Trail</i>	360*	348*	360*	360*	325*	360*	348*	360*	348*	0	0	0	11.600	5	3,169
															124,927
															97,552**

†AADV=Annual Average Daily Visitors, the total whole day counts for the given year, divided by the number of whole days with the data in that year

* Some monthly totals are estimated when there is only partial data for the month. The values shown are calculated based on the daily average for the available data multiplied by the number of days in that month.

††Adjusted Totals, where data is incomplete, are calculated by multiplying the AADT by the number of days in that year.

**VCNP Totals are adjusted to exclude non-reportables (employees, service vehicles, etc), for FY2011 non-reportables = 27,375.

Appendix A

2011 Schedule for Calibration Surveys

June 2011

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2 Survey PM	3	4
5	6 Survey AM	7	8	9	10 Survey AM	11
12	13	14 Survey AM	15	16	17	18
19	20	21	22 Survey AM	23	24	25 Survey PM
26 Survey PM	27	28	29	30		

July 2011

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3 Survey PM	4	5	6	7 Survey AM	8	9
10	11 Survey PM	12	13	14	15 Survey PM	16
17	18	19	20 Survey AM	21	22	23 Survey AM
24	25	26 Survey PM	27	28	29	30

September 2011

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
28	29	30	31	1	2 Survey PM	3
4 Survey AM	5	6	7 Survey PM	8	9	10
11	12	13	14	15 Survey AM	16	17
18	19	20 Survey PM	21	22	23	24 Survey PM
25	26 Survey AM	27	28	29	30	

Appendix B
Persons Per Vehicle Survey
Instructions and Form

INSTRUCTIONS FOR ENTERING DATA ON THE PERSONS-PER-VEHICLE SURVEY FORM

Valles Caldera National Preserve

1. This form is to be used to determine the number of persons per vehicle entering the Preserve. The VCNP staff will randomize the time schedule for each survey day. If a survey time period is marked AM please conduct a one hour survey between the hours of 8:00 AM and 12:00 PM. If the survey time period is marked PM please conduct a one hour survey between the hours of 12:00 PM and 5:00 PM. The surveyor conducts the survey for only one (1) hour during the sample period. The surveyor selects the time period when he/she can conduct the sampling on the survey day and at the survey location. Please vary your starting times during each sample periods and they do not need to start on the hour but need to be conducted for a one hour period.

2. The surveyor fills out the bottom of the form by entering their name, the date the survey is conducted, the time period of the survey, and always conducted **at the main VCNP gate.**

3. To fill out the body of the form, the surveyor counts the number of people in the vehicles as they enter the gate. A tally mark is then placed in the appropriate box representing the number of persons in that vehicle. (If there are 2 persons in a vehicle, put a tally mark in column two (2). If there are more than 6 passengers in a vehicle, put the exact number in column 7+.

4. Ask the driver the two questions on the form. Be friendly and explain the reason for the survey.

If you have any questions, please contact me at the above address or phone 5505.428.7717. Thank you for your cooperation

PERSONS-PER-VEHICLE (Autos)

Survey Form

BLOCK 1	NUMBER OF PERSONS-PER-VEHICLE							
	1	2	3	4	5	6	7+	
RECREATION VEHICLES								
TOTAL VEHICLES								A.
PERSON MULTIPLIER	x 1	x 2	x 3	x 4	x 5	x 6	SUM OF ENTRIES	
TOTAL PEOPLE								B.
							AVG. PPV (^B / _A) =	C.

Put ONE Tick Mark for each Vehicle in the appropriate column above which corresponds to the number of people within the vehicle. For example, if there are 5 people in a car, one tick mark would be noted in column five. This survey should be carried out the entire survey time period. At the end of the day, please tally the subtotals at the bottom and complete the appropriate math.

If you have any questions, please call Tim Haarmann, 505.428.7717

Survey Questions:

1. Today, have you stopped, or do you plan to stop, at one of the Pull-outs on Highway 4? Y or N

Yes	No
Total:	Total

2. Today, have you hiked, or do you plan to hike, on the Coyote Call or Valle Grande Trail? Y or N

Yes	No
Total:	Total

SAMPLE DATE: / /

SURVEY LOCATION

SURVEYOR _____