A disease outbreak in North America caused by a hantavirus occurred in 1993 in the Four Corners area of the southwestern United States (1). Deer mice (Peromyscus maniculatus) were identified as the primary reservoir of Sin Nombre virus (SNV) (2), an orthohantavirus and the causative agent of hantavirus pulmonary syndrome (HPS) (3). That outbreak might have been associated with an El Niño weather event the preceding winter, which could have led to increases in deer mouse infestations in buildings (4). Investigations into the outbreak and subsequent HPS cases found most cases had probable indoor exposures (5,6) and almost one fourth of all human case exposures were associated with a recreational setting (7).

During the summer of 2012, a total of 10 persons subsequently given a diagnosis of hantavirus infection visited Yosemite National Park in California, USA (8,9). SNV exposure for 9 case-patients was associated with staying overnight in a signature tent cabin, a canvas tent structure with interior insulated walls, located in Curry Village in Yosemite Valley (8,9); the tenth infection was associated with lodging in regular tent cabins in the Tuolumne Meadows area. The subsequent environmental investigation found that most of the signature tent cabins had rodent infestations in the insulated walls. A high overnight trap success rate (51%) for Peromyscus spp. mice and a 14% (10/73) SNV seroprevalence in deer mice were observed in Curry Village during the initial trapping event in August 2012 (8). The park responded by closing and subsequently removing the signature tent cabins, increasing staff and visitor education for HPS prevention, enhancing mouse control measures in and around human-made structures (8,9), and applying rodent exclusion measures to other buildings (8).

In September 2012, the Peromyscus spp. trap success rate in Curry Village was substantially lower (14%), and no (0/10) deer mice were positive for SNV (8). We summarize rodent trappings and SNV serosurveys for Peromyscus mice in Yosemite Valley and Tuolumne Meadows after the outbreak of infection with hantavirus during 2012. These activities were conducted to monitor relative abundance of deer mice, help assess the peridomestic rodent control efforts in the park, and reduce HPS risk in this heavily used recreational area.

We compared Peromyscus spp. mouse overnight trap success rates and captured Peromyscus mouse species...
Rodent Surveillance and Hantavirus Infection composition and SNV seroprevalence in deer mice from peridomestic sites in Yosemite Valley during 2013–2018 with findings from the initial outbreak investigation in August–September 2012 and with findings of similar trapping events conducted in developed areas of Tuolumne Meadows. We also evaluated whether location or climatic factors influenced relative rodent abundance and SNV seroprevalence. Finally, we sought to identify demographic characteristics of SNV-positive deer mice captured in Yosemite National Park.

Methods

Site Selection, Description of Study Areas, and Study Period
Yosemite National Park is in the Sierra Nevada mountain range in California. Yosemite Valley (37.745570, -119.593604) is located in the west-central portion of the park (Figure 1) and covers ≈18 km² at an average elevation of 1,209 m. The primary habitat of Yosemite Valley is lower montane forest, dominated by California black oak (Quercus kelloggii), ponderosa pine (Pinus ponderosa), incense cedar (Calocedrus decurrens), and white fir (Abies concolor) (10). Curry Village is located near the eastern end of Yosemite Valley in a highly developed area that contains other visitor lodging, park administration buildings, and staff housing.

During May 2013–October 2018, rodent surveillance by the California Department of Public Health (CDPH) Vector-Borne Disease Section was conducted 11 times at Curry Village and other nearby peridomestic sites on the basis of park staff requests (Figure 1). In 2013, trapping was conducted in Yosemite

Figure 1. Yosemite National Park, California, USA, and trapping sites, with hillside shading, in Yosemite Valley and Tuolumne Meadows. Sources of mapping data were Esri (https://www.esri.com), Airbus Defence and Space, US Geological Survey, National Geospatial-Intelligence Agency, National Aeronautics and Space Administration, Consultative Group on International Agricultural Research, N. Robinson, National Center for Ecological Analysis and Synthesis, National Library Service, Ordnance Survey, National Mapping Association, Geodataysteryelsen, Rijkswaterstaat, General Services Administration, Geoland, Federal Emergency Management Agency, Intermap, and the Geographic Information System user community.
Valley only in May. In subsequent years, trapping was conducted twice annually, in spring (May–June), to assess peridomestic deer mouse abundance and identify potential problem areas before peak tourist visitation, and fall (October–November) (Table 1), when peridomestic deer mouse trap success typically peaks (CDPH and National Park Service [NPS], unpub. data).

Six additional rodent trapping events were conducted annually during 2013–2018 in developed areas of Tuolumne Meadows (37.873107, −119.435709), where previous HPS case-patients have been exposed (8); Tuolumne Meadows is located ≈26 km northeast of Yosemite Valley (Figure 1) at an elevation of 2,602 m. The primary habitat is upper montane-subalpine, dominated by Sierra lodgepole (Pinus contorta murrayana), Ross sedge (Carex rossii), western white pine (Pinus monticola), and mountain hemlock (Tsuga mertensiana) (10). Trapping in Tuolumne Meadows was conducted in and around guest lodging and employee housing (Figure 1). With the exception of June 2016, trapping events in Tuolumne Meadows were conducted in August or September, months when this area was most likely to be accessible and facilities open.

Trapping Protocol
All rodent trapping and handling was conducted according to protocols of the CDPH Institutional Animal Care and Use Committee (ACUP no. 2013-14–no. 2018-14). Rodent trapping used Sherman live traps (H.B. Sherman Traps, https://www.shermantraps.com). Each event consisted of a single overnight trapping period, with 100–200 traps in Yosemite Valley or 44–180 traps in Tuolumne Meadows. Traps were primarily placed outside buildings and tent cabins and left open from ≈5:00 pm to 8:00 am the following day. A total of 75–81 traps were set outdoors in Curry Village during each Yosemite Valley trapping event. A limited number of traps (0–26/event) were placed indoors to evaluate potential for rodent ingress or in response to reported mouse activity. Beginning in November 2014, a total of 25 traps/event were also set on a transect through a natural habitat adjacent to Curry Village, 25–75 m from any human-made structure, for comparison to peridomestic locations.

Traps were baited with a mixture of corn, oats, and barley, and a ball of polystyrene fill was placed inside as nesting material. Captured rodents were anesthetized with isoflurane, identified to species, sex, and age group, measured for weight, and assessed for the presence of ear scars or notches. Approximately 100 µL of blood was collected into a heparinized capillary tube from the retro-orbital sinus, then stored on ice or refrigerated before transport to the laboratory. All Peromyscus mice collected in or near a building were humanely euthanized. P. boylii (brush mice) trapped in the natural area adjacent to Curry Village and all other rodent species trapped were released at their point of capture.

Sample Testing
Peromyscus mouse blood samples were submitted to the CDPH Viral and Rickettsial Disease Laboratory to screen for evidence of antibodies against SNV and SNV RNA. Serum or whole blood was analyzed for SNV IgG by using an ELISA (2) to detect antibody directed against a purified recombinant Sin Nombre nucleocapsid protein that is strongly recognized by antibodies against orthohantaviruses associated with subfamily Sigmodontinae rodents. Rodent blood samples were also screened for evidence of SNV RNA by using a real-time reverse transcription PCR (RT-PCR) targeting an 81-nt region of the small segment of the genome (GenBank accession no. L33816) (11), which is highly conserved across known SNV strains.

Data Analysis
We excluded all non-Peromyscus rodent captures from data analyses. We estimated relative Peromyscus rodent abundance by using trap success (no. Peromyscus rodents trapped/no. traps set) for each trapping event at each site type and calculated the proportion of captured Peromyscus mice that were deer mice for each site type at each trapping event (no. deer mice/no. all Peromyscus rodent captures). We estimated seroprevalence by the percentage of deer mice sampled that were positive for SNV antibodies. We obtained climate data from the PRISM climate group (12); variables used were mean monthly temperature for the month of the trapping event (°C), mean monthly temperature from 6 months before (°C), current winter temperature from 12 months before (°C), current water year (total precipitation from the preceding October 1 through April 30, mm), and the previous water year (Table 1).

We analyzed data by using R statistical software (13). We made comparisons for trap success, proportions of Peromyscus species captures that were deer mice, and deer mouse seroprevalence in Yosemite Valley during June 2013–October 2018 to those from August 2012 and September 2012 in Yosemite Valley, in the natural area adjacent to Curry Village (2014–2018 for both datasets), and in Tuolumne Meadows by using χ² analysis. Because we made 5 comparisons, we
applied the Bonferroni correction to χ² analyses; only p < 0.01 was considered significant. If a cell size was < 5 by any χ² analysis, we then used the Fisher exact test.

We conducted regression analyses on all data collected for Yosemite Valley and Tuolumne Meadows after 2013. We used multivariate linear regression to find associations between relative rodent abundance and time as a continuous variable, season as a categorical variable (spring or fall), site (Curry Village, Curry Village natural area, other Yosemite Valley peridomestic sites, and Tuolumne Meadows), current and previous climatic variables, and current and previous relative rodent abundance. We also used multivariate linear regression to determine whether the proportion of Peromyscus captures at an event that were deer mice was associated with time, season, site, current and previous climatic variables, and current and previous proportions of deer mouse captures. We analyzed the relationship between seroprevalence and date, season, peridomestic versus natural area, current and previous relative rodent abundance and dominance by using multivariate linear regression. We then used multivariate logistic regression to identify which demographic variables (age, sex, weight, presence of ear notches/scars) were associated with detecting positive deer mice.

Results

Summary Statistics

During May 2013–October 2018, CDPH conducted 11 trapping events (1,574 trap nights of surveillance) at peridomestic sites in Yosemite Valley, and captured 231 rodents (overall trap success rate 14.7%); there were no recaptures. Thirty-one (2.0%) traps were set inside buildings, and only 1 deer mouse was captured.

Table 1. Dates, locations, and climate data for Sin Nombre virus surveillance, Yosemite National Park, California, USA, 2013–2018

| Trap date     | Location       | Mean monthly temperature, °C | Trapping month | 6 months before | 1 year before | Total water year, mm | Total water year, mm, from year before |
|---------------|----------------|------------------------------|----------------|-----------------|---------------|----------------------|------------------------------------------|
| 2013 May 30   | Yosemite Valley| 12.9                         | 7.0            | 16.9            | 643.01        | 547.43               |                                          |
| 2013 Sep 10   | Tuolumne Meadows| 9.2                         | 0.7            | 10.5            | 541.02        | 426.65               |                                          |
| 2014 Jun 26   | Yosemite Valley| 18.2                         | 7.5            | 18.4            | 451.25        | 643.01               |                                          |
| 2014 Sep 9    | Tuolumne Meadows| 9.9                         | −0.8           | 9.2             | 384.94        | 541.02               |                                          |
| 2014 Nov 13   | Yosemite Valley| 7.6                          | 18.3           | 7.5             | 451.25        | 643.01               |                                          |
| 2015 May 19   | Yosemite Valley| 11.2                         | 7.6            | 13.2            | 398.61        | 451.25               |                                          |
| 2015 Aug 26   | Tuolumne Meadows| 12.6                         | 1.4            | 11.4            | 316.54        | 384.94               |                                          |
| 2015 Oct 22   | Yosemite Valley| 13.7                         | 8.8            | 14.6            | 398.61        | 451.25               |                                          |
| 2016 May 25   | Yosemite Valley| 11.7                         | 4.1            | 11.2            | 956.50        | 398.61               |                                          |
| 2016 Jun 22   | Tuolumne Meadows| 10.6                         | −5.5           | 11.4            | 744.60        | 316.54               |                                          |
| 2016 Oct 12   | Yosemite Valley| 11.4                         | 9.3            | 13.7            | 956.50        | 398.61               |                                          |
| 2017 May 24   | Yosemite Valley| 12.9                         | 7.3            | 11.7            | 1,871.10      | 956.50               |                                          |
| 2017 Aug 9    | Tuolumne Meadows| 12.9                         | −0.9           | 12.5            | 1,637.41      | 744.60               |                                          |
| 2017 Oct 18   | Yosemite Valley| 12.7                         | 7.8            | 11.4            | 1,871.10      | 956.50               |                                          |
| 2018 May 17   | Yosemite Valley| 12.6                         | 7.6            | 12.9            | 731.19        | 1,871.10             |                                          |
| 2018 Aug 22   | Tuolumne Meadows| 12.8                         | −3.7           | 12.9            | 648.49        | 1,637.41             |                                          |
| 2018 Oct 9    | Yosemite Valley| 12.0                         | 9.0            | 12.7            | 731.19        | 1,871.10             |                                          |

Figure 2. Peromyscus rodent trap success and seroprevalence (with sample sizes) of SNV in deer mice (Peromyscus maniculatus), Yosemite National Park, California, USA, 2012–2018. A) Yosemite Valley; B) Tuolumne Meadows. Numbers in parentheses indicate no. positive deer mice/no. tested. Figures include data from the August–September 2012 outbreak investigation (8) for reference. SNV, Sin Nombre virus.
inddoors (trap success rate 3.2%). Deer mice represented 148 (64.1%) of all captures; the remainder consisted of 70 (30.3%) brush mice, 2 shrews (Sorex spp.), 5 house mice (Mus musculus), 2 roof rats (Rattus rattus), and 4 unidentified Peromyscus rodents that escaped before processing.

Blood samples were collected from 147 deer mice (Table 2), and 7 (4.8%) were positive for antibodies to SNV (Figure 2, panel A). We also tested 67 brush mouse blood samples for SNV antibodies, and all were negative. We retested 6 deer mouse blood samples that had SNV antibodies and 131 that did not have SNV antibodies for SNV RNA by real-time RT-PCR. Three (50%) of the 6 antibody-positive deer mice were also positive for SNV RNA, and only 1 (0.8%) of 131 seronegative deer mice showed positive results. We also tested 34 brush mice by using real-time RT-PCR; all were negative for SNV RNA.

The natural area adjacent to Curry Village was trapped during 9 events from November 2014 through October 2018 for 223 trap nights. Thirty-three deer mice represented 7 (20.6%) of the captures; 26 (76.5%) of the captures were brush mice. We tested blood samples from 7 deer mice (Table 2) and 13 brush mice for antibodies to SNV; all were negative. We retested 6 deer mice and all 13 brush mice by using real-time RT-PCR; all were negative for SNV RNA.

Table 2. Characteristics of Peromyscus maniculatus rodents tested for Sin Nombre virus in Yosemite National Park, California, USA, 2013–2018*

| Characteristic category | Value |
|------------------------|-------|
| Sex                    |       |
| M                      | 21/147 (14.3)† |
| F                      | 12/188 (6.5) |
| Age                    |       |
| Adult                  | 24/189 (12.7) |
| Subadult               | 9/107 (8.4) |
| Juvenile               | 0/37 (0) |
| Ear scarred, torn, or notched† | 3/13 (18.8) |
| Location               |       |
| Curry Village          | 4/88 (4.5) |
| Other Yosemite Valley peridomestic area | 3/59 (5.1) |
| Curry Village natural area | 0/7 (0) |
| Tuolumne Meadows       | 26/179 (14.5)† |
| Mean weight, g         |       |
| Antibody negative M    | 14.7 |
| F                      | 15.9 |
| Antibody positive M    | 17.1§ |
| F                      | 17.2§ |

*Values are no. antibody positive/no. tested (%) unless otherwise indicated.
†Significantly greater than others in category.
‡Observations about the presence of ear scars, tears, or notches were not systematically recorded.
§Significant difference between antibody positive and antibody negative.

During September 2013–October 2018, a total of 534 trap nights during 6 surveillance events in Tuolumne Meadows captured 195 rodents (trap success rate 36.5%); there were no recaptures. Deer mice represented 179 captures (91.8%), and the remaining 16 captures consisted of 8 wood rats (Neotoma cinerea), 3 chipmunks (Tamias spp.), 4 golden-mantled ground squirrels (Callospermophilus lateralis), and 1 long-tailed vole (Microtus longicaudus). Blood samples were collected from all 179 deer mice (Table 2) and 26 (14.5%) were positive for SNV antibodies (Figure 2, panel B).

**Trends in Peromyscus spp. Trap Success**

The overall Peromyscus trap success rate at peridomestic sites in Yosemite Valley (14.1%) (Figure 2, panel A) was significantly lower during 2013–2018 than that during the initial August 2012 outbreak investigation ($\chi^2$ 142.6; $p<0.01$), although not from the September 2012 surveillance event ($\chi^2 <0.1; p = 0.99$). Within Yosemite Valley, we found no significant difference in the Peromyscus trap success between Curry Village (14.2%) and other peridomestic sites in Yosemite Valley (13.9%; $\chi^2 <0.1; p = 0.88$). We also noted no significant difference in trap success rates between all Yosemite Valley peridomestic locations combined and the natural area adjacent to Curry Village (14.8%; $\chi^2 0.1; p = 0.78$). However, Peromyscus trap success in Yosemite Valley during the study was significantly lower than that in Tuolumne Meadows (33.7%; $\chi^2 11.8; p<0.01$) (Figure 2, panel B). When we performed analysis by using multivariate regression, we found no significant association between relative rodent abundance and date, season, and any current or previous climatic variable.

**Trends in Peromyscus spp. Rodent Captures**

The proportion of Peromyscus spp. rodent captures that were P. maniculatus deer mice (82.2%) at peridomestic locations in Yosemite Valley during 2013–2018 was not different from those observed in August 2012 (73.3%; $\chi^2 3.2; p = 0.07$) and September 2012 (52.6%; $\chi^2 1.8; p = 0.18$) (Figure 3). Although most Peromyscus rodent captures at peridomestic sites in Yosemite Valley were deer mice (75.4%), deer mice were significantly less likely to be trapped in the natural area adjacent to Curry Village (24.2%; $\chi^2 33.1; p<0.01$). The proportion of Peromyscus rodent captures that were deer mice did not have a significant linear relationship with time, season, site, current and previous climate variables, or current and previous trap success.

**Trends in SNV Seroprevalence**

SNV antibody seroprevalence in deer mice sampled at peridomestic sites in Yosemite Valley was not...
significantly different than that observed during August 2012 ($\chi^2 5.4; p = 0.02$) or September 2012 ($p = 1.00$ by Fisher exact test). Within Yosemite Valley, no significant difference occurred in detection of SNV-positive deer mice in peridomestic areas compared with the natural area ($p = 1.00$ by Fisher exact test). However, seroprevalence was significantly lower at peridomestic sites in Yosemite Valley than in Tuolumne Meadows during the study ($\chi^2 32.9; p<0.01$). We found no relationship between seroprevalence in Yosemite Valley deer mice and time, season, peridomestic versus natural area, or concurrent or previous relative Peromyscus rodent abundance and $P$. maniculatus mouse dominance. When analyzed by logistic regression, we found that seropositive deer mice from Yosemite Valley and Tuolumne Meadows were significantly more likely to be male ($\beta = 1.09; p = 0.02$) and have higher body weights ($\beta = 0.16; p = 0.01$); no other demographic variables were significant.

**Discussion**

During the initial Yosemite hantavirus outbreak investigation in August 2012, a robust population of deer mice in Curry Village was identified, although SNV seroprevalence was not unusually increased (8). Just a few weeks later, after the signature tent cabins were closed and rodent control and exclusion measures were enacted, trap success for deer mice was substantially lower (8). Our study found that overall trap success during May 2013–October 2018 in Yosemite Valley remained lower than that observed during August 2012. The rodent control measures implemented by the park and concessionaires have likely contributed to lower Peromyscus rodent trap success in these peridomestic locations. To a lesser degree, the cumulative effect of removing Peromyscus mice from peridomestic locations during our surveillance events might have also contributed to the control effort. Although current and previous precipitation amounts were not associated with Peromyscus rodent trap success, we cannot rule out the effects of the historic drought in California during 2011–2015 (12). The end of the drought might have contributed to the trend of increasing trap success rates seen during 2016–2018. Although a few SNV-seropositive deer mice have continued to be detected since 2012, rodent control measures that limit the number of deer mice around and in buildings have likely decreased HPS exposure risk (14,15).

Overall, deer mice represented a similar proportion of the Peromyscus rodent captures from peridomestic locations during 2013–2018 as during the outbreak investigation in 2012. However, the proportion of deer mouse and brush mouse captures from these locations fluctuated after 2012, suggesting the relative abundance of these species changed over time. Interspecific competition between these sympatric species (16), climatic factors, or some combination of these effects probably contributed to the observed trends in trap success, but habitat preferences might also affect local abundance. Deer mice are the most common Peromyscus species in California, found in almost any habitat, and commonly enter buildings (17). Brush mice are found mainly below an elevation of 2,000 m (17) and have a preference for rocky areas in brush or woodlands (18), although they will readily enter human-made structures. Although preferred habitats for both species occur in Yosemite Valley, highly developed locations providing human-made harborage and food sources might favor deer mouse abundance.

Although deer mice predominated at peridomestic sites, brush mice were captured more frequently at the natural area sampled. This trap line was only 25–75 m from tent cabins and other buildings in Curry Village, both locations potentially within typical home ranges of deer mice (41–4,452 m$^2$) and brush mice (162–3,845 m$^2$) (19). Despite the proximity of these habitats, brush mice were the dominant, often only, Peromyscus species trapped in the natural area. This finding supports the need for minimizing peridomestic harborage that might favor deer mouse abundance. In addition, maintaining natural environments to the extent possible in Yosemite Valley could increase competition from brush mice, which are not known reservoirs of SNV (20). Increasing rodent diversity could also reduce SNV prevalence in deer mice (21,22).

We were unable to detect many major trends in deer mouse seroprevalence. Although SNV seroprevalence in Yosemite Valley decreased during August–September 2012 and typically remained lower in
subsequent years, we found no significant differences in 
seroprevalence between either month during 2012 and 
that observed during 2013–2018 because of Bonferroni 
adjustment for multiple comparisons and low $p$ value 
threshold. Other, much larger, studies have detected 
relationships between deer mouse seroprevalence and 
previous rodent population density (14,23,24) or age 
(14,21,23,25,26), neither of which we observed, probably 
because of our smaller sample size. Also, potentially 
because of inconsistent collection of qualitative observa-
tions of body condition, we were unable to determine 
whether seropositive deer mice were more likely to 
have wounds (14,23,25–27). However, we did find that 
male and heavier deer mice were more likely to be sero-
positive, as seen in other studies (14,21,23,25–27).

We also compared trapping results and SNV se-
roprevalence from Yosemite Valley during 2013–2018 
to Tuolumne Meadows. Despite trapping around 
similar types of buildings, the deer mouse trap suc-
cess rate and SNV seroprevalence were higher in Tu-
olumne Meadows. This location is 1,400 m higher in 
elevation, outside the range of brush mice, and no oth-
er *Peromyscus* rodent species have been trapped here 
during previous CDPH surveillance events (CDPH, 
unpub. data). Tuolumne Meadows is also less de-
veloped than Yosemite Valley, and most buildings are 
used only seasonally, typically during June–Septem-
ber. Given the absence of other *Peromyscus* rodent 
species and abundance of seasonally used buildings 
in an otherwise natural montane habitat, the consist-
tent abundance of deer mice and higher SNV sero-
prevalence at Tuolumne Meadows is not surprising. 
Higher SNV seroprevalence rates relative to Yosemite 
Valley were observed in previous surveillance events 
in this area (CDPH, unpub. data) and in deer mice 
sampled at other higher elevations in California (28). 
This area was associated with 3 previous HPS cases 
during 2000, 2010, and 2012 (8), and although more 
cases of infection with hantavirus have been associat-
ed with Yosemite Valley, all 9 cases were linked with 
the 2012 outbreak and the subsequently removed 
signature tent cabins. Our surveillance results and 
the sporadic occurrence of HPS cases underscore the 
need for maintaining hantavirus awareness and pre-
vention measures in the Tuolumne Meadows area.

Since 2012, the NPS and concessionaires have ex-

dpanded their efforts beyond Curry Village to improve 
roden exclusion in other buildings, reduce rodent har-
borage in peridomestic habitats, and conduct regular 
mouse trapping in developed areas of the park (8). A 
previous study in Yosemite found that rodent-proofed 
homes are less likely to be infested with mice and, if 
infested, have fewer mice (29). In addition to snap-
trapping indoors, Yosemite staff conduct routine out-
door snap-trapping around buildings that are difficult 
to exclude, which assists in peridomestic rodent control 
and provides monitoring for spatiotemporal increases in 
*Peromyscus* rodent abundance. Early indications of 
increases in rodent abundance prompt the initiation of 
specified actions to reduce human risk for exposure to 
SNV (30). To assist the park and concessionaire with 
identifying rodent exclusion issues, CDPH has con-
ducted >300 building evaluations during 2013–2018.

After the outbreak during 2012, NPS and conces-

sionaires expanded their public education programs 
to reduce the risk for HPS. NPS added hantavirus 
information to its Yosemite website, placed edu-
cational posters in central locations, and offers infor-

mational brochures to visitors (8). Visitors at Curry 
Village and other tent cabin lodgings are provided 
with information about hantavirus at check-in and 
prevention methods are posted in each tent cabin 
(8). These efforts, combined with improvements in 
roden exclusion and control measures and ongoing 
roden surveillance, have helped to strongly reduce 
peridomestic abundance of deer mice and the risk for 
exposure to HPS for visitors and staff in Yosemite.

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overall monitoring work of CDPH.

**About the Author**

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