

**From:** [Mary](#)  
**To:** [Ayers, Dana](#)  
**Cc:** [Tracy Parker](#); [captkent2@sbcglobal.net](mailto:captkent2@sbcglobal.net)  
**Subject:** Palmas helicopter  
**Date:** Tuesday, February 28, 2017 5:08:36 PM

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Please count this email as a vote against the proposed allowance for flights via helicopter by the palmaz winery. Supposedly flights would be restricted to family, however how could flights be monitored to show occupants are actually family and not visitors?

Again, I'm unequivocally opposed to this proposal.

Thank you

Mary E Poliak

Napa resident.

Sent from my iPhone

**From:** [Morrison, David](#)  
**To:** [Frost, Melissa](#); [Fuller, Lashun](#); [Ayers, Dana](#)  
**Subject:** FW: Heliport  
**Date:** Wednesday, March 01, 2017 11:20:51 AM

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-----Original Message-----

From: Reinaldo Estrada Renaud [<mailto:reinaldo9@att.net>]  
Sent: Wednesday, March 01, 2017 11:17 AM  
To: Pedroza, Alfredo  
Cc: Morrison, David  
Subject: Heliport

Alfredo, I am asking the Board of Supervisors not support the Heliport request now before the board for the following reasons:

1. It establishes a precedent that will place the County in the position of defending any future denials, subject to costly court challenges.
2. It is a "luxury" request; not a medical, fire, police, or military service need.
3. The requestor has the capacity to pay for transport to and from the airport.
4. Requestors present and future can access and support Napa County Uber and Lyft providers, given the income bases to support the costs associated with the purchase and operation of a helicopter.
5. A "quiet" helicopter does and will create noise and vibration day or night obvious to humans and animals. (I speak from experience) Finally, helicopters diminish what the County and Valley purport as "Our Quality of Life".

Ron Rhyno

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**From:** [Kirsty Shelton Gerosa](#)  
**To:** [jerigillpc@outlook.com](#); [mikebasayne@gmail.com](#); [tkscottco@aol.com](#); [joellegpc@gmail.com](#); [anne.l.cottrell@gmail.com](#)  
**Cc:** [Robert Pursell](#); [Frank Farella](#); [Ayers, Dana](#); [Frost, Melissa](#)  
**Subject:** Palmaz heliport - Please keep public comment open  
**Date:** Wednesday, March 01, 2017 7:47:28 AM

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Good morning,

Today you will be hearing about the merits of the Palmaz heliport EIR and for the first time hearing public comment on the merits of the use permit to allow the use. As I understand the staff report there will be a handout on the use permit's conformance with the Napa County General Plan. I believe this is the most vital analysis for the public to comment on and for the Commission to benefit from those comments. Because today will be the first time both the public and the Commission will have the opportunity to review the General Plan analysis, I urge you to keep the public comment open on the merits of the use permit to the next hearing.

Thank you,

Kirsty Shelton-Gerosa

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Farella Braun + Martel LLP

**From:** [Tony & Linda McClimans](#)  
**To:** [Ayers, Dana](#)  
**Subject:** 3/1/17 Palmaz Helicopter UP Public Hearing  
**Date:** Wednesday, March 01, 2017 7:09:56 AM

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Please add this email to the Public Hearing record.

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We, the people of Napa County, are rather fond of "domestic tranquility", one of the foundational reasons for establishing government.

In all probability Napa County has some policy justification for prohibiting this, and similar subsequent noise nuisances.

To rationalize that this is only one instance is to ignore that it would set a precedent for others. Napa County has no shortage of property owners and/or businesses who can afford helicopters.

To trust that, once operational, this heliport (or subsequent imitators) wouldn't become a more public use is to turn a blind eye to the Valley's sad history of creeping commercialism and inadequate zoning enforcement.

If the County finds it difficult to police nuisances on land, imagine the difficulty of policing nuisances aloft.

I trust that you can find a defensible reason to deny the application; and that if you do, the community will judge you did your part to promote domestic tranquility.

Tony McClimans  
3611 Mt Veeder Road  
Napa 94558

**Ayers, Dana**

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**Subject:** FW: Palmaz Heli-Pad

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**From:** Planning  
**Sent:** Wednesday, March 01, 2017 6:37 AM  
**To:** Ayers, Dana; Frost, Melissa  
**Subject:** FW: Palmaz Heli-Pad

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**From:** morgan morgan [<mailto:m2morgan@hotmail.com>]  
**Sent:** Tuesday, February 28, 2017 3:20 PM  
**To:** Planning  
**Subject:** Palmaz Heli-Pad

Dear Mr. Mufson

We are writing to ask that you review the legality of heli-pads in Napa County. The Palmaz heli-pad request is coming before the County Planning Commission tomorrow morning (March 1st). I spoke against the helipad at the last hearing.

We have spent years fighting low, illegal, invasive flights of hot air balloons over our property. But we have failed to have any impact on their behavior. Why? Because the FAA is their jurisdiction. Therefore, the County, City, State, have NO ability to influence or control their behavior. They are also at the beck and call of the weather, winds, etc. and will use that as their excuse for a low flight or deviated time of flight, or other reasons not to conform with rules that the County thinks they will apply to the permit.

So if the County gives a land use permit for an activity that it cannot control i.e. flight, is that legal? Can you really put the county in that position? It would not matter how many rules you would include with the permit about what they can and cannot do. Once they are airborne the County's ability to control it is NIL.

We strongly suggest you do NOT allow this permit to go forward. We believe there are airport commissions for a reason!

And we hope not to subject the citizens of Napa to what we experience every day - abuse by the hot air balloon companies flying low over our home, invading our privacy, causing unwanted noise and harassment. Reality of an environment over which you have NO jurisdiction.

Thank you for listening.

**Morgan Morgan**  
**Business Manager**  
**Oak Knoll Ranch/Lamoreaux Vineyards**  
**(707) 226-6515**  
**(415) 640-6535 cell**

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**From:** [Patricia Damery](#)  
**To:** [Ayers, Dana](#)  
**Subject:** Heli-port  
**Date:** Wednesday, March 01, 2017 6:16:28 AM

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Dear Ms. Ayers,

I am writing to comment on the application for the Palmaz Heliport.

I take great issue with the Planning Department's recommendation to permit a private heliport on Hagen Road, Mt. George, or anywhere else, for that matter, deeming the negative impacts of such a helipad, after mitigation, as insignificant.

Private use helicopters are solely for private recreational or convenience purposes. Helicopters are prone to accidents and produce 3 to 5 times the CO2 and NOX emissions that fuel efficient cars produce. But what I want to address is the impact of the noise. I cannot imagine how this Draft EIR can suggest noise can be mitigated to be insignificant!

Any of us know the noise a helicopter makes. I live in the west side of the valley. When the sheriff's helicopter flies over our home, or within a mile or so, we know. The whole house echoes with that characteristic staccato-like thumping. It's one thing if it is an emergency airlift to a hospital. That's the proper use of a helicopter. But it's a whole other thing if it is for someone's convenience, someone understandably wanting to avoid the commute up and down our beautiful valley. But their convenience is at the expense of the relative peace and quiet for many of us on the ground !

And the noise doesn't just bother us humans. Some years ago a private helicopter buzzed our ranch, flying over our home and our goat and llama pen, terrifying the animals so much the llama lunged through a wooden corral board fence, breaking the boards. Luckily the llama only suffered bruising.

Helicopters not only put humans' nerves on edge: they terrify animals. They have no business in the airspace over our cities, Ag Preserve and Ag Watershed Open Space areas. And if you certify this heliport but there are sure to be a whole bunch more applications coming in. You are opening a door to a kind hell of noise.

You have a duty to protect our quality of life in our Napa Valley, The cumulative impact of an increasing number of helicopters in the airspace of our county will threaten that quality of life.

Sincerely,  
Patricia Damery  
3185 Dry Creek Road  
Napa, CA

MAR 01 2017

Agenda Item # 8A

March 1, 2017

Thank you for this opportunity for comment.

I take great issue with the Planning Department's recommendation to permit a private heliport anywhere, deeming the negative impacts of Palmaz helipad, after mitigation, as insignificant.

Helicopters are prone to accidents and produce 3 to 5 times the emissions that fuel efficient cars produce. But what I want to address is the impact of the noise. I cannot imagine how this FEIR can suggest noise can be mitigated to be insignificant!

Any of us know the noise a helicopter makes. I live on the west side of the valley. When the sheriff's helicopter flies over our home, or within a mile or so, we know. The whole house echoes with that characteristic staccato-like thumping. It's one thing if it is an emergency airlift to a hospital. That's the proper use of a helicopter. But it's a whole other thing if it is for someone's convenience, someone understandably wanting to avoid the commute up and down our valley. But their convenience is at the expense of the relative peace and quiet for many of us on the ground!

And the noise doesn't just bother us humans. Some years ago a private helicopter buzzed our ranch, flying over our home and our goat and llama pen, terrifying the animals so much the llama lunged through a wooden corral board fence, breaking the boards. Luckily the llama only suffered bruising.

Helicopters not only put humans' nerves on edge: they terrify animals. They have no business in the airspace over our cities, Ag, and AWOS zoned areas. And if you certify this heliport, there are certain to be a lot more applications coming in. You are opening a door to a kind hell for many of us.

You have a duty to protect our quality of life in our Napa Valley. The cumulative impact of an increasing number of helicopters in the airspace of our county will threaten that quality of life. I ask you to turn down this project.

Patricia Damery  
Dry Creek Road, Napa



**From:** [louiseav@sbcglobal.net](mailto:louiseav@sbcglobal.net)  
**To:** [Alfredo Pedroza](#); [Anne Cottrell](#); [Ramos, Belia](#); [Wagenknecht, Brad](#); [Jeri Gill](#); [Joelle Gallagher](#); [Ayers, Dana](#); [Diane Dillon](#); [Gregory, Ryan](#); [Michael Basayne](#); [Terry Scott](#)  
**Subject:** Fwd: Palmaz Use Permit Comments  
**Date:** Tuesday, February 28, 2017 8:59:20 PM  
**Attachments:** [Palmaz Use Permit.pdf](#)  
[2017palmazhelipadcom.pdf](#)

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## **Subject: Palmaz Use Permit Comments**

Please find comments regarding the Palmaz use permit request.

February 28, 2017

To: Dana Ayers, Planner III, Napa County Planning

County of Napa Planning Commissioners

County of Napa Supervisors

**Amalia Palmaz Living Trust/Palmaz Personal Use Heliport, Use Permit Application # P14-00261 - UP**

Re: Palmaz Private Helipad and Hangar Project including the Mt. George Alternative Comments

Thank you for the opportunity to submit my comments regarding the County's issuance of a Conditional Use Permit for Private Use of Helicopter landings on the Palmaz' properties. I will not be able to attend the hearing tomorrow, but wish for my written comments to be entered into the public record opposing the issuance of conditional use permit #P14-00261

I object to the County's policy to grant Conditional Use Permits for the Private Use of helicopter landings on residential property. This request is a private use that is not in the best interest of the general welfare of the residents of Napa County. This is an individual residential conditional use request that should be denied on that basis. The issuance of this permit would serve as a precedence and nexus for additional permit applications that will have detrimental effects on the general welfare of Napa County. This includes the undue burden on the County to regulate, monitor, and enforce compliance over a practice in which it has no existing regulatory jurisdiction.

The Alternative Mt. George site appears to be a contradictory option as it is not a residential parcel, yet is being proposed for a residential use permit. The Alternative Mt. George site appears to have cause for more potential "deviations" due to the safety of traveling on the steeply graded, narrow, and unpaved road. This will occur in both the less busy non-agricultural time of year due to inclement weather and also the remaining time of the year when this road is busy as an agricultural vineyard access road with trucks, tractors, excavators and other farm vehicles. When such "conflicts" occur at this site and the applicants have to drive home via Highway 121, it appears they will spend just as much time and effort driving to get home than if they had just decided to drive home from the airport directly.

Specific comments on the Project update are identified below:

**2.1**

**Applicants Voluntary Enforcement Tracking: 1) Flight Monitoring and 2) No-Fly Compliance.**

As stated in the update, Flight monitoring is to be conducted and submitted to the County on a quarterly basis in addition to a GPS surveillance system tracking the arrival and departure of **all** flights.

**Four inbound and four outbound flights per week equal FOUR HUNDRED and SIXTEEN flights a year – this sounds like a full time job!**

Who is responsible for this new and additional regulatory monitoring, review, complaint investigation and evaluation of “compliance”? Does the County have the existing time and staff to review this data? The applicant should be required to pay for any County costs that will be required to regulate, monitor and or enforce this use. The monitoring and enforcement burden of a private individual’s use permit requirements should not be supported by the general populous’ tax dollars.

What would be the penalty if the applicant does not comply with the “established flight track” or if the Airport Land Use Commission finds the merits of a “deviation” unnecessary? How many “penalties” would be allowed before the conditional use permit would be revoked? One, two, three? Would a bond be required as a part of the use permit requirements?

What would be the requirements for the transparency of the reporting and monitoring of all complaints?

### **Approach and Departure Flight Tracks**

The project update states that on “rare” occasions, the helicopter may deviate from the established flight track. The definition of “rare” needs to be established. As written in the project update this term is ambiguous and there can be no basis for monitoring and compliance. How does the County define “rare” - once a month, once a year, or once every 5 years? What is the recourse for too many “deviations”?

Because this conditional use permit involves an aircraft, it will be subject to jurisdiction of the Federal Aviation Administration once the helicopter takes flight. How will Napa County administer the conditions of a permit that is not under their jurisdiction?

### **Issues or Potential Impacts not Discussed Further**

The Project Update states that the project site and alternative site provide limited habitat to nesting birds because the sites are adjacent to existing vineyard development and operations. However, the Mt. George Alternative site as described in the project update is surrounded by grasses and forbs, and chaparral with California bay and coast live oaks scattered throughout. In order to properly evaluate the effects of this project, a breeding bird survey of nesting birds of the Alternative site is warranted based on this habitat description

In closing, I wonder why the simple, practical and reasonable alternative of the applicants driving their car from the Napa County airport to their house was not included in the analysis as an option. As you can see from the attached google maps, it is a minimal drive of 10 miles that takes less than 25 minutes from the Palmaz residence to the airport. The applicant has not justified that a true need exists for this request that is actually in the best interest and welfare of the general public. The County should not issue this conditional use permit as a viable alternative currently exists.

Sincerely,

Louise Accurso Vicencio

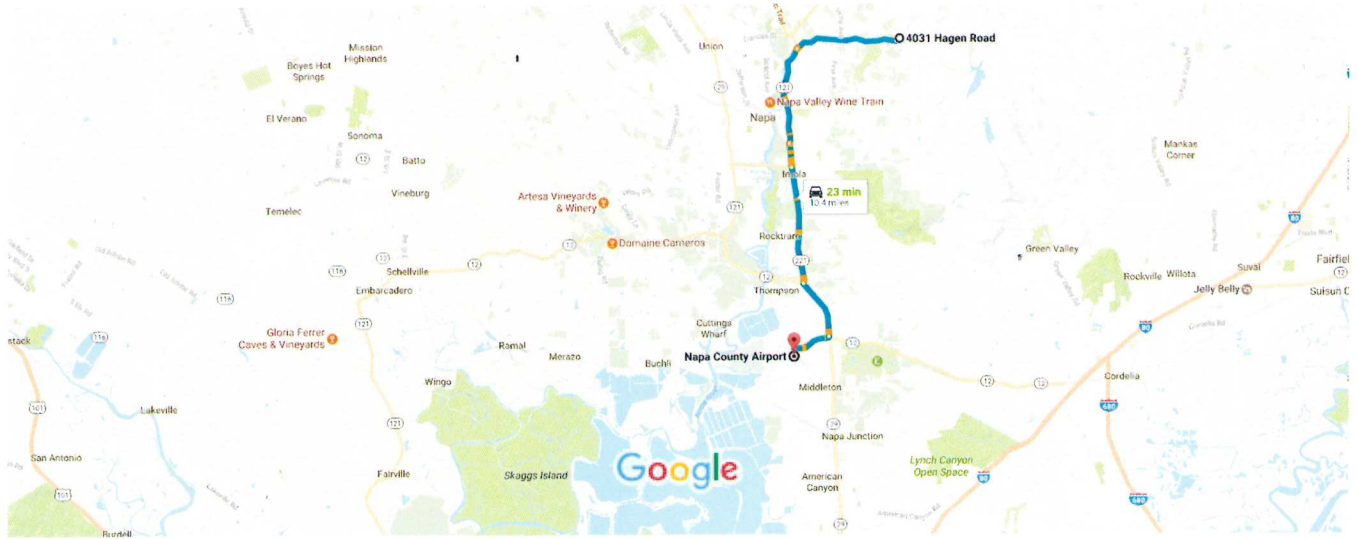
1141 Petra Dr. Napa

Attachment



4031 Hagen Road, Napa, CA to Napa County Airport

Drive 10.4 miles, 23 min



Map data ©2017 Google 2 mi

via CA-221 S

23 min

10.4 miles

Planning Commission Mtg.  
MAR 01 2017  
Agenda Item # 8A

**From:** [sgalb@aol.com](mailto:sgalb@aol.com)  
**To:** [Ayers, Dana](#)  
**Subject:** Comments -Palmaz Heliport App # p14-00261  
**Date:** Tuesday, February 28, 2017 6:26:03 PM  
**Attachments:** [filing Feb 28 2017.docx](#)

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Dear Dana,  
Would you please file the attached comments? Thanks very much,  
Sarah Galbraith

From Sarah Dunlap Galbraith

Property owner 2300 Third Avenue North. This property abuts Palmaz vineyard property to the South.

The EIR (3.7) concludes that there is no significant increase in the risk of a wildfire in the area due to helicopter operations. This conclusion ignores that while the risk may be low a fire could be catastrophic for neighboring parcels. I request that the Palmaz Trust be required to post a bond that would indemnify neighbors (and state and local authorities) in the event of a fire attributable to activities under this permit, whether or not negligence can be proved. I made this request in my comments on the proposed EIR (EIR Comments and Responses 133-4). The Department's response was that my request was not something that could be discussed in an EIR but could be considered by the Planning Commission, so I offer it now.

Responding to my request in my comments on the DEIR ( EIR Comments and Responses 133-2) the Department has now included a map of the Lake Marie – the Cedars/ Adams Ridge Essential Connectivity Area. (Ex 2-6 FEIR). The DEIR had stated (DEIR 3.3-6) that the proposed project and alternate site were within the ECA but at the western edge and that any impact would be less than significant because of the small project footprint and already existing noise levels.

In fact the inset to Exhibit 2-6 (FEIR) shows that the Palmaz properties are the location of a real bottleneck for this ECA. While the proposed project site is not far from the western edge the alternate site is almost at the eastern edge of the more permeable area. In fact the access road up the mountain from the residence area to the proposed alternate site stretches almost all the way across the more permeable area. If ECAs have any relevance the impacts ought to be specifically addressed.

In comments to the draft EIR many people including myself expressed concern that the draft had not adequately addressed environmental concerns about the alternate site. (See, e.g., EIR 3-133 –(6-10).) We had to request – and did receive – clarification at the DEIR hearing that the applicant's access to and from the heliport would be by the the road that goes straight up the south peak of Mt. George. As I read the Department's response to my comment (3-133-8) the construction phase would be staged along this road also. If this is so some thorough analysis of the impacts of heavy machinery on this fragile hillside should be included.

My appreciation to the Planning Department and the Planning Commission for their consideration of these points.

Sarah Dunlap Galbraith

February 28. 2017

Second.

The project does not meet the definition of a Personal Use Airport and Heliport as outlined in the Napa County municipal code.

Section 18.08.460 defines a Personal Use Airport and Heliport as benefiting, quote "an individual owner or family ... and occasional invited guest."

County staff and the EIR vendor have both made a very simple mistake. The word "family" has a specific definition in Napa County municipal code section 18.08280. The definition is, and I quote, "one or more persons living together under a single management conducted by one or more persons in the group." Simply having the same last name Palmaz is not enough.

Amalia Palmaz and her husband Dr. Julio Palmaz are by the above definition one family living together on the project site. Christian Palmaz and his family live nearby on a separate legal parcel. And Florencia Palmaz on a third legal parcel. They are by the above definition three separate families. And the application before you clearly lists the applicants as Amalia Palmaz under her trust and Christian Palmaz. Two separate families as applicants.

This is black letter and not subject to debate or interpretation. The above application does not meet the definition of a Personal Use Airport or Heliport; it is simply an airport and as such is not an allowable use in the AG preserve.

Before I move onto point #3, it should be noted the proposed alternate site also fails to meet the above definition as the parcel is a non-contiguous, raw land parcel. It would set a dangerous precedent to allow anyone to purchase a raw land parcel miles away from their residence and entitle it with a personal use airport.

Sarah Purcell



PLANNING  
COMMISSION  
ITEM 8A  
FEB 28  
2017

Geoff Ellsworth  
IM 8A SPEAKING FOR THE  
ST. HELENA CITY COUNCIL

Feb. 28  
2017

LAST NIGHT WE HAD THE SUBJECT  
OF PRIVATE USE HELIPORTS SUCH AS  
THIS, IN NAPA COUNTY ON THE  
ST. HELENA CITY COUNCIL AGENDA, TO  
DISCUSS CONCERNS RELATING TO IMPACTS  
FROM PROJECTS SUCH AS THIS INCLUDING  
ENVIRONMENTAL, NOISE, FIRE AND  
SAFETY IMPACTS, AS ~~WELL~~ AS  
WELL AS POSSIBLE PROPERTY VALUE  
IMPACTS

BECAUSE OF THE QUICK TURN AROUND  
TO TODAY'S MEETING WE  
WEREN'T ABLE TO CREATE ANY  
SPECIFIC LANGUAGE BUT WE'LL  
BE RE-AGENDIZING THE ISSUE  
FOR THE NEXT MEETING TO  
AGREE ON A STATEMENT OF  
CONCERN AND A POSSIBLE  
RESOLUTION OPPOSING PRIVATE  
USE HELIPORTS, SUCH AS THIS  
IN NAPA COUNTY

~~ADD COUNCIL WOULD  
LIKE TO DISCUSS  
IM 8A~~

Geoff Ellsworth  
gellsworth@  
cityofsthelena.  
org

## Additions to the Palmaz Use Permit Conditions of Approval

Submitted by Deborah Holley for Michelle Goss -- March 1, 2017

1. The Use Permit shall limit use to just one helicopter to be operated by the permit holder. Items 1.2 and 1.3 in the Recommended Conditions of Approval shall be revised as follows (added text underlined): “1.2 Use of the heliport solely for the permittee’s one helicopter, and which helicopter shall meet or exceed noise level requirements for Stage 3 certification by the Federal Aviation Administration with only one helicopter stored onsite at a time; and 1.3 Up to four arrivals and departure flights per week by the permittee’s helicopter, for noncommercial use by the aircraft owner and occasional invited guests. Under no circumstances are “invited guests” to mean guests invited to fly their own aircraft and use the onsite helipad.”
2. The Use Permit shall be granted for six months. At the six-month mark, the records regarding complaints, flights, etc., shall be reviewed. If the Planning Commission determines that the project has been operating according to the agreed upon terms without violations, then the permit could be extended for an additional six months. This review process would continue to ensure that no violations have occurred and avoids the potential for hearings and litigation to drag on in the event that the County needs to take action to revoke the permit.
3. Provide weekly email noticing of scheduled flights so that residents know when to expect excessive noise and vibration. As many residents testified at the DEIR hearing, part of the stress and anxiety with helicopter noise and vibration is sudden unexpected nature of the noise, the worry that an emergency has occurred, etc. This should be provided to all residents within a two-mile radius.
4. Provide specific monitoring, reporting, and enforcement measures. Enforcement shall include a dedicated person at the County with contact information, including name, phone number, and email address. This information should be listed on the County website and mailed to residents within a two-mile radius. This person would be responsible for responding to and documenting complaints as well as quarterly review of the adherence to the conditions specified in the Use Permit with reports posted online.
5. Agreement to Pay Permittee-Induced Legal Costs. Permittee/property owner shall agree to pay Napa County’s legal costs in the event that the permittee/property owner engages in unsuccessful litigation regarding the County’s authority to limit flight activity or use of the helipad facility.
6. If the permittee/property owner sells the property, the Use Permit becomes null and void. This would avoid a situation where a future property owner may argue that local control does not apply and pursue litigation.

# ANNOTATED ATLAS AND IMPLICATIONS FOR THE CONSERVATION OF HERON AND EGRET NESTING COLONIES IN THE SAN FRANCISCO BAY AREA

JOHN P. KELLY, KATIE ETIENNE, CHERYL STRONG,  
MARK MCCAUSTLAND, AND MICHAEL L. PARKES



ACR Technical Report 90-3-17  
© August 2006, Audubon Canyon Ranch  
P. O. Box 808, Marshall, CA 94940

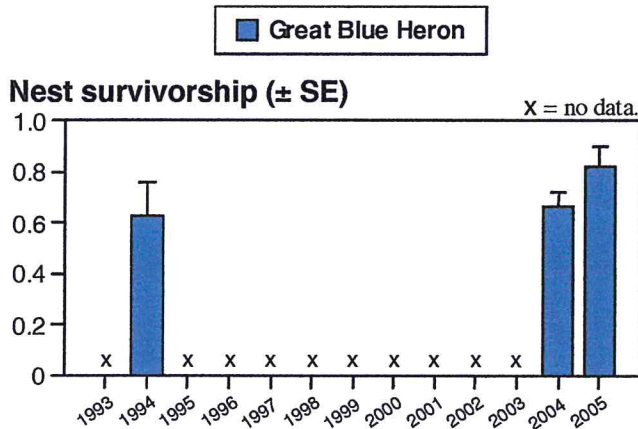
# Hagen Road

This heronry is about 5 km northwest of the City of Napa at the end of Hagen Road. Great Blue Herons nest in rows of tall eucalyptus lining a private, gated lane. The trees are on vineyard property, near a parking lot and equipment garage. The Napa River is 3.5 km west of the site.

Ownership: private

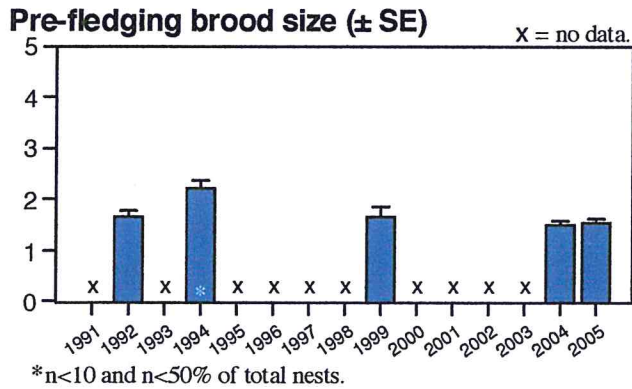
Public observation areas: none

Latitude / Longitude: N 38.3239 / W 122.2345



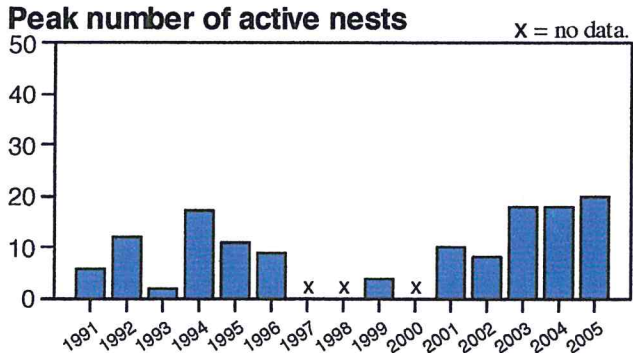
## Colony site description

Topography: flood plain  
 Length x width: 59 m x 14 m  
 Nest substrate: Eucalyptus sp. (live and dead branches)  
 Average nest height: 30 m  
 Trees (dbh): 5 (50-100 cm), 5 (100-150 cm)  
 Maximum tree canopy height: 31 m  
 Vegetation cover: tree 20%, shrub 6%, ground 26%



## Evidence of disturbance

American Crows: potential source<sup>a</sup>  
 Common Raven: potential source<sup>a</sup>  
<sup>a</sup>Possible disturbance suggested by published accounts (see references in Methods).



## Land use

Land use	Distance from colony site (m)			
	0-100	100-200	200-500	500-1000
Low density housing	X		X	X
Mid-density housing				X
Vineyard	X	X	X	X
Grazing				X

runoff (Kushlan 1977, Frederick 2002). Therefore, long-term shifts in heron and egret nesting distributions may be particularly useful in monitoring the cumulative, landscape-scale effects of tidal marsh restoration or enhancement projects. Given the value of suitable feeding areas near heronries, regional planners could enhance the value of wetland landscapes to nesting herons and egrets by promoting clusters of smaller restoration or enhancement projects within several km of colony sites.

## RECOMMENDED BUFFER ZONES

Nesting herons and egrets can be easily disturbed by human activity and may respond by abandoning their nests or colony sites (Dusi and Dusi 1987, Hafner 2000). At some sites, nesting herons and egrets tolerate human activity at close range (Nisbet 2000; Hothem and Hatch 2004). However, tolerance levels are highly variable over time and among heronries, and unpredictable changes in the type, proximity, or intensity of human activity at any site may adversely affect the nesting birds (Tremblay and Ellison 1979, Vos et al. 1985, Rodgers and Smith 1995, Hafner 2000, Kelly 2002; pers. observation). Adverse effects of human disturbance include egg and nestling mortality, premature fledging, reduced body mass or slower growth of nestlings, and reduced settlement of breeders in the colony (Rodgers and Smith 1995, Hafner 2000, Frederick 2002). Even temporary abandonment can lead to nest failure during unfavorable weather or in the presence of opportunistic predators such as crows or ravens (Burger and Hahn 1977, Tremblay and Ellison 1979, Hafner 2000).

The responses of herons and egrets to disturbance can vary substantially among the stages of the breeding season (Figure 9; Butler 1992, Hafner 2000, Kelly 2002). Colonies are most easily disturbed when some individuals are still in the pre-laying or courtship phase (January-March). As birds settle into the incubation phase, they become more site-tenacious (March-April). As nestlings grow larger and are able to thermoregulate, adults may temporarily alter their behavior or flee without neglecting their young (May-June). Near the end of

the nesting season (June-August or later), adults are rarely present at their nests, returning only to feed their young. At this time, nestlings are large and alert to disturbance but reluctant to flee from their nests. Nestlings forced to flee before they are mature enough to find their way back into their nests may not survive.

The responses of nesting herons and egrets to disturbance by humans also vary with differences in the structure of the nesting habitat and types of human activity (Kelly 2002). Herons and egrets nesting in very tall trees or very dense vegetation may be less sensitive to disturbance, whereas herons and egrets nesting in open habitat or isolated trees tend to react earlier and more intensely to approaching humans. Fledging success may be greater in heronries that are isolated by moat-like water barriers or fencing than at sites isolated only by greater distances to human activity (Carlson and McLean 1996).

Erwin (1989) recommended 200-m buffer distances to protect heronries from human disturbance. This was based on 100-m flush distances plus an additional 100 m to protect colony sites early in the season before all nests are established. Butler (1992) suggested buffer zones of 300 m from Great Blue Heron colonies, but indicated that the most easily disturbed herons in a colony in British Columbia remained in their nests until he approached within 200 m. Rodgers and Smith (1995) recommended a 100 m buffer around wading bird colonies in Florida, based on upper 95th percentile of standard normal flush distances, i.e., the distance beyond the average disturbance distance at which disturbance is not expected 95% of the time. Their estimate incorporated flush distances plus 40 m for other (unmeasured) responses, such as intraseasonal differences, alert/agonistic responses prior to flushing, differences in vegetation cover etc. Disturbance trials conducted at 23 heronries in the San Francisco Bay Area in 1994 indicated substantial tolerance of approaching humans at some heronries but considerable variation in responses, both among heronries and among stages of nesting (Kelly 2002). The results were consistent with buffer zones of 100-200-m based on the responses of nesting birds to a single person approaching on foot.

An important consideration in determining appropriate buffer zones around heronries is that the

distances recommended by scientific investigators are generally based only on one or two humans approaching on foot. Larger groups of people or other types of human activity are likely to disturb heronries at greater distances. Boats tend to be less disturbing to nesting herons and egrets than some other types of human intrusion. Vos et al. (1985) found that boat disturbance distances average only about 50-85 m, but they did not measure the distance that is likely to prevent disturbance 95% of the time. Disturbance by groups of boats rather than single boats might increase the width of the disturbance zone. In general, the size of buffer zones should be increased with increases in the expected frequency, duration, or extent of human activity.

Nisbet (2000) argued that, where appropriate, waterbird colonies could be managed for multiple uses including research, education, and recreation, to promote habituation of nesting birds to human activity and thereby reduce adverse impacts of disturbance. Such habituation may contribute to the variability among heronries in their tolerances to human activity, although the actual reasons for such differences are unknown. Although some investigators have suggested that habituation may be possible (Nisbet 2000, Frederick 2002), this has not been clearly demonstrated with regard to a capacity of behavioral change in nesting adults. In contrast, other investigators have presented evidence indicating increasingly adverse effects of repeated or prolonged disturbance (Tremblay and Ellison 1979, Rodgers and Smith 1995). Any attempts to promote or rely on habituation should be implemented very cautiously because (1) serious adverse effects of human disturbance on heronries are well-documented, (2) the sensitivity of nesting birds to human activity is highly variable and difficult to assess, (3) the potential for habituation is unknown, (4) any disturbance by humans could result in opportunistic nest predation by diurnal avian predators such as gulls or ravens, and (5) the behaviors of humans can be unpredictable (Carney and Sydeman 1999, 2000, Nisbet 2000). Therefore, even at sites where birds appear to be relatively tolerant of human activity, managers should consider the use of appropriate barriers and buffer distances, with careful attention to nesting behaviors and the timing of nesting stages (Parnell et al. 1988, Hafner 2000).

Because heronries vary widely in their responses to human disturbance, we recommend establishing buffer zones of at least 200 m around heronries to minimize the potential adverse effects of human intrusion during the nesting season. These buffer zones should be established from 1 January to 30 June for Great Blue Herons, and 1 March to 31 August for other species. However, because late nesting attempts may extend beyond these dates, a qualified biological observer should confirm that herons and egrets are no longer occupying the colony site at the end of the nesting period before increases in human activity are allowed.

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