Application for an Incidental Harassment Authorization, for taking of small numbers of marine mammals by harassment, pursuant to 1994 amendments to the Marine Mammal Protection Act of 1972, section 101 (a)(5).

Location: San Nicolas Island, Ventura County, California

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Determination that an Incidental Harassment Authorization is the appropriate permitting option for the subject activity:

1) Is there any potential for serious injury or mortality to marine mammals in the area of activity?

Activity involves research on populations of black abalones (*Haliotis cracherodii* Leach, 1814), listed as "endangered" in 2009 pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq*.) as amended (ESA), in rocky intertidal habitats in two regions:

Applicant G. VanBlaricom made 137 separate field trips to San Nicolas Island (SNI) from September 1979 through October 2011, with trips averaging approximately six days in length. To date the applicant has done abalone survey work during low tides on 723 different days at nine permanent study sites on SNI. Interest in the project from federal and state management agencies increased as a consequence of the January 2009 listing of black abalones as "endangered", pursuant to ESA. It is anticipated that the subject research on black abalone populations at SNI will continue at a similar level of activity for at least the next five years.

Species to be affected by proposed Incidental Harassment, in association with the subject research, are as follows:

California sea lion (*Zalophus californianus* [Lesson, 1828]);
Pacific harbor seal (*Phoca vitulina richardii* [Gray, 1864]);
Northern elephant seal (*Mirounga angustirostris* [Gill, 1866]).

Animals likely to be affected by abalone research activity are those that are hauled out on land near study sites. Variable numbers of sea lions, harbor seals, and elephant seals typically haul out near six of the nine study sites, and rarely near a seventh (details

below), used for abalone research. In addition, a single adult male Guadalupe fur seal (*Arctocephalus townsendi* Merriam, 1897) was seen at one abalone research site on two occasions during summer months in the early 1980s. Finally, a small population (~50 individuals) of sea otters (*Enhydra lutris* [L., 1758] occurs in the nearshore waters at SNI, as a result of translocation activity by the US Fish and Wildlife Service from 1987 through 1991. Sea otters have been seen hauled out on beaches at SNI occasionally since the translocation project, but none have ever been seen hauled out at or near any of the nine permanent black abalone study sites since translocation activity began in 1987.

Breeding activity of the three relatively common pinniped species occurs at five of the seven sites used by hauled pinnipeds. In virtually all cases the shoreline habitats near the abalone study sites are gently sloping sandy beaches or horizontal sandstone platforms with unimpeded and non-hazardous access to the water for hauled animals. If disturbed, hauled animals may move toward the water without risk of encountering significant hazards. In these circumstances the risk of serious injury or death to hauled animals is nil. Although California sea lions haul out at some locations with precipitous relief along the SNI shoreline, none of those locations is near any of the designated study sites for abalone research. Thus, abalone research activity poses no risk that disturbed animals may fall and be injured or killed as a result of disturbance at high-relief locations.

There are two exceptions to the general pattern of low risk of marine mammal injury or mortality associated with abalone research activity at SNI. First, if disturbances occur during breeding season for the species involved, it is possible that mothers and dependent pups may become separated. If separated pairs do not reunite in a short time, risks of mortality to pups may increase. Second, adult male northern elephant seals may trample elephant seal pups if disturbed. Trampling increases the risk of injury or death to the pups.

2) Can the potential for serious injury or mortality be negated through mitigation requirements that could be required under the authorization?

The two possible categories of increased risk of injury or mortality, as indicated above, can be mitigated with measures that could be required under the authorization. Disturbances to mothers with dependent pups, in the cases of California sea lions and Pacific harbor seals, can be mitigated by avoiding visits to study areas 1, 5, 6, 7, and 8 (Figure 1) during periods of breeding and lactation from approximately 15 February through 15 October. During such periods, abalone research work can be confined to sites 2, 3, 4, and 9 where pinniped breeding and post-partum nursing does not occur. Male and juvenile California sea lions are often seen at site 9, and rarely at site 4, but breeding and pupping activities have never been observed for any marine mammal species at sites 4 or 9. Small numbers of northern elephant seals (< 10 individuals) are sometimes also seen at sites 1 and 9, but breeding or pupping by northern elephant seals do not occur at either site. Risks of trampling of elephant seal pups by adults are limited to the period from January through March when pups are born, nursed, and weaned, ending about 30 days post-weaning when pups depart for foraging areas at sea (more details below). However, elephant seals have a much higher tolerance of nearby human activity than do sea lions or

harbor seals. Thus, all study sites can be occupied by researchers at any time of the year without disturbing elephant seals. Mitigation of the risk of disturbance simply requires that researchers are judicious in the route of approach to abalone study sites, avoiding close contact with elephant seals hauled out on shore.

As noted above, a single Guadalupe fur seal was seen at abalone study site 8 on SNI on two occasions during summer months in the early 1980s. None have been seen during abalone research work since then. Guadalupe fur seals are distinctive in appearance and behavior, and can be readily identified at a distance without disturbance. Mitigation of possible harassment, injury, or mortality of Guadalupe fur seals can be achieved by immediately suspending research work and vacating any study area in which Guadalupe fur seals are seen.

As noted above, sea otters were reintroduced to waters near SNI from 1987 through 1991, and a small population currently is present near SNI. None have ever been seen hauled out during abalone research work at the permanent study sites since the relocation project began. Sea otters are distinctive in appearance and behavior, and can be readily identified at a distance without disturbance. Applicant G. VanBlaricom had a lead role in the sea otter relocation program at SNI and has a history of experience with research and observation of sea otters dating to 1977. Mitigation of possible harassment, injury, or mortality of sea otters can be achieved by immediately suspending research work and vacating any study area in which sea otters are seen hauled out.

Given the above responses, it is the opinion of the applicants that an Incidental Harassment Authorization is the appropriate permitting option for the subject activity.

Information required for consideration by the National Marine Fisheries Service of an application for Incidental Harassment Authorization:

(1) A detailed description of the specific activity or class of activities that can be expected to result in incidental taking of marine mammals:

The purpose of the activity is to assess trends in black abalone populations at San Nicolas Island (SNI), Ventura County, California. Trends are assessed with population surveys done over time in permanent study sites. Related research is done on the biology and ecology of black abalones, also in the permanent study sites, relevant to current conservation concerns for the species. Population trend data for black abalone populations have become important in a conservation context because of the following issues:

a) The appearance of a novel exotic disease, abalone withering syndrome, at SNI in 1992, resulting in dramatically increased rates of abalone mortality on the Islands;

b) The reintroduction of sea otters (*Enhydra lutris* [L., 1758]) to SNI in 1987 by the U.S. Fish and Wildlife Service, raising the possibility of conflict between

conservation of sea otter and abalone populations in southern California (abalones are often significant prey for sea otters). The possibility for conflict has been augmented in recent years by natural expansion of the mainland California sea otter population into the nearshore marine waters of mainland western Santa Barbara County south and east of Pt. Conception, increasing the presence of sea otters in southern California waters, and increasing the probability of natural dispersal of sea otters from the mainland coastal area to SNI.

c) The 1999 federal designation of California populations of black abalones as a Candidate Species in the context of ESA;

d) The 2003 designation of all populations of black abalones as critically endangered by the International Union for the Conservation of Nature (IUCN; also known formerly as the World Conservation Union);

e) The 2004 federal designation of California populations of black abalones as a Species of Concern in the context of ESA;

f) The December 2006 petition for adding black abalones to the List of Threatened and Endangered Species; and

g) The federal listing of black abalones as "endangered", pursuant to ESA, in 2009 as noted above.

Work at SNI is done primarily by faculty, staff and students associated with the Washington Cooperative Fish and Wildlife Research Unit (a component of the Cooperative Research Units Program, U.S. Geological Survey) and the University of Washington. The U.S. Navy (owner of SNI) provides crucial logistical support and cooperation for all research work done at SNI. Additional logistical support is provided by research staff from the University of California, Santa Cruz. Funding for black abalone research work at SNI is currently provided by the U.S. Geological Survey; the Office of Protected Resources of the Southwest Region, National Marine Fisheries Service; the California Sea Grant College Program; the School of Aquatic and Fishery Sciences of the University of Washington; and the U.S. Navy.

Quantitative abalone surveys began at SNI in 1981 following reconnaissance surveys in 1979 and 1980, in anticipation of the Southern Sea Otter relocation program in that began in 1987 under the auspices of the U.S. Fish and Wildlife Service. A map of the nine permanent study sites (from VanBlaricom 1993) is provided below. During the surveys done in 2002 it became clear that additional work could not be done at sites 5, 6, 7, 8, and 9 (see referenced map) without the possibility of inadvertent incidental harassment of pinniped populations hauled out at or near the study locations. During survey work in 2003 and 2004, significant numbers of California sea lions were seen for the first time at sites 1 and 4. Thus, of the nine study sites used in for the abalone surveys, only sites 2 and 3 can be occupied without disturbing at least one species of pinniped. Subject marine

mammal populations (especially California sea lions and northern elephant seals) at SNI have grown substantially since the beginning of abalone research in 1979, and have occupied an expanded distribution at SNI in association with population growth. Thus, sites previously accessible with no risk of marine mammal harassment are now being utilized by marine mammals at levels such that approach without harassment is no longer possible.

Research is conducted by counting abalones in plots of 1 m^2 along permanent transect lines in rocky intertidal habitats at each of the nine study sites at SNI. Permanent transect lines are demarcated by stainless steel eyebolts embedded in the rocky habitat and secured with marine epoxy compound. Lines are placed temporarily between bolts during surveys and are removed once surveys are completed. Survey work is done by two field biologists working on foot. Additional methodological detail is available in VanBlaricom 1993 and VanBlaricom et al. 1993.

The National Marine Fisheries Service convened a Status Review Team for black abalones in June 2007 as mandated by ESA. The Status Review Team recommended that black abalones be listed as "endangered" (VanBlaricom et al. 2009, Neuman et al. 2010). The recommended listing was implemented by the Secretary of Commerce in January 2009. The Black Abalone Recovery Team was convened on 18-19 October 2011, and applicant G. VanBlaricom was selected by Team members as Leader of the Team on 19 October 2011. As part of the scoping process preceding the status review, a need for additional research on growth and mortality rates of young black abalones was identified. In addition, scientists with the Office of Protected Resources, Southwest Region, National Marine Fisheries Service (OPR/NMFS have encouraged development of new research on the genetic relatedness of adult abalones with recently observed juvenile abalones in three of the nine study sites (sites 3, 5, and 7) at SNI. Applicant G. VanBlaricom is currently developing detailed study plans for subject genetic studies. Applicant G. VanBlaricom is also collaborating with scientists at OPR/NMFS on tagging studies of small black abalones at SNI to measure growth and mortality rates. The genetic and tagging studies require additional field effort beyond that necessary for the established population surveys as described above. Genetic studies at SNI will be done primarily at sites 3, 5, 7, and 8. Most tagging work will be done at site 8 (Figure 1) because of relatively high availability of young black abalones as compared to other study sites. Abalone tagging work was suspended at the time of listing of black abalones as "endangered" in January 2009, and will be resumed if and when appropriate research permits, pursuant to ESA, are obtained. Genetic studies must also await the approval and issuance of an ESA permit. An application for the subject ESA permit is currently in preparation.

Field work involving black abalone populations at SNI can be done only during periods of extreme low tides. The exact date of a visit to any given site is difficult to predict because variation in surf height and sea conditions can influence the safety of field biologists as well as the quality of the data collected. In most years survey work has been done during the months of January, February, March, October, November, and December because of optimal availability of daytime low tides. All work is done only during

daylight hours because of safety considerations, and because daytime work clearly facilitates improved data quality as compared to night work. Sites 1, 5, 6, 7, and 8 are generally avoided from 15 February through 15 October to minimize any risk of disturbance to newborn dependent pups of harbor seals and California sea lions. Northern elephant seal pups are present at the subject sites during winter months, but all age and sex categories of this species can be easily avoided without harassment. Thus, the period from about 15 October to about 15 February generally is preferable for survey work in the context of minimizing the risk of incidental harassment of marine mammals. However, survey work from 15 October through 15 February may be interrupted more frequently than survey work in other months by large breaking surf resulting from winter storms. In some cases during winter, breaking waves may be large enough to compromise the safety of abalone survey personnel, requiring delays in survey work.

Resulting data obtained from field studies at SNI likely will be published in refereed scientific journals and agency technical reports because the data are likely to contribute to the resolution of a conservation problem, and possibly to the recovery of an endangered species. Six papers have been published based on data collected at SNI in previous years (VanBlaricom 1993, VanBlaricom et al. 1993, Chambers et al. 2005 & 2006, Neuman et al. 2010, and VanBlaricom et al. 2011/in press). Future publications and agency technical reports are likely. Data on black abalones from SNI were also incorporated into the Black Abalone Status Review noted above. There is concern that the effects of abalone withering syndrome, following on several decades during which black abalones may have been over-harvested in commercial and recreational fisheries and by illegal removals, may continue to constrain black abalone populations to low densities and a high consequent risk of extinction. The long-term abalone population trend data from SNI will contribute at a significant level in determining if drastic population depletion persists, and if extinction risk remains high.

(2) The date(s) and duration of such activity and the specific geographical region where it will occur:

It is requested that the subject Incidental Harassment Authorization be effective for the period approximately from 1 January through 31 December 2012.

As presently planned, black abalone population surveys and research will extend through at least 2017. Additional work in years after 2017 remains a possibility, depending on available of funding. Given plans by applicant G. VanBlaricom for retirement after 40 yrs of federal service in 2017, continuation of abalone research at SNI after 2017 also will require involvement of new scientists.

Surveys of black abalones at SNI will continue to be done annually. During each survey year sites 1, 4, 6, and 9 at SNI will be visited 1-3 times in order to complete standard annual black abalone surveys. We plan to visit sites 3, 5, and 7 three times per year, and site 8 five times per year because of the need for additional field time to complete data collection for abalone genetic and tagging work as noted in item #1 above, pending issuance of appropriate ESA permits, in addition to the annual abalone population

surveys. There should be no limit to the number of visits made to sites 2 and 3 because pinnipeds have not been seen hauled out at either site at any time since 1979. Each visit to a given study site lasts for a maximum of 4 hrs, after which the site is vacated and can be reoccupied by any hauled marine mammals that were disturbed by the presence of researchers.

The subject research will be conducted at San Nicolas Island (SNI), Ventura County, California, USA. Specific study areas at SNI are indicated in Table 1 and Figure 1.

Table 1: Latitude and longitude coordinates of the nine permanent study sites for black abalone research at San Nicolas Island.

Site Number	Latitude	Longitude
1	33º 16.57'N	119º 34.42'W
2	33º 17.07'N	119º 31.78'W
3	33º 15.31'N	119º 27.61'W
4	33º 13.34'N	119º 26.24'W
5	33º 12.95'N	119º 27.52'W
6	33º 12.92'N	119º 28.52'W
7	33º 13.12'N	119º 29.79'W
8	33º 13.87'N	119º 32.11'W
9	33º 15.36'N	119º 34.12'W

Specific study areas at which harassment of marine mammals may occur are identified in Table 1 and on the map as sites 1, 4, 5, 6, 7, 8, and 9. Sites 2 and 3 do not have resident pinniped populations, and can be visited without any risk of marine mammal harassment. Sites 9 is used for hauling out by non-breeding northern elephant seals and non-breeding California sea lions, and site 4 is used on rare occasions by non-breeding California sea lions.

(3) The species and numbers of marine mammals likely to be found within the activity area:

The following marine mammal species may be present on haulout sites in the immediate vicinity of abalone research sites at SNI: California sea lion, Pacific harbor seal, northern elephant seal, and Guadalupe fur seal. Sites are indicated in Table 1 and Figure 1. Following (Table 2) are estimates of the ***maximum*** likely numbers of marine mammals that would be present in immediate proximity to abalone survey study areas during periods of visitation by abalone researchers. These estimates are based primarily on observations recorded by applicant G. VanBlaricom at SNI during abalone research work from 2003 through 2009, under the auspices of previous Incidental Harassment Authorizations issued by NMFS to G. VanBlaricom. Data were collected during non-breeding periods for California sea lions and Pacific harbor seals.

Table 2: *Maximum* numbers of marine mammals, by species, likely to be found hauled out in or near abalone survey study areas at San Nicolas Island (SNI). "Fur seals" refers to Guadalupe fur seals. (*) denotes non-breeding animals.

Site	Sea lions	Fur seals	Harbor seals	Elephant seals
1	110	0	0	5*
2	0	0	0	0
3	0	0	0	0
4	150*	0	0	0
5	150	0	40	100
6	400	0	40	300
7	650	0	10	80
8	500	1	0	20
9	10*	0	0	20*
Totals:	1970	1	90	525

(4) A description of the status, distribution, and seasonal distribution (when applicable) of the affected species or stocks of marine mammals likely to be affected by such activities:

California sea lion:

a) Status: California sea lions at SNI are part of the U.S. stock, as defined by the National Marine Fisheries Service (NMFS). The most recent NMFS Stock Assessment Report (SAR) for the U.S. stock of California sea lions is dated 30 October 2007 (www.nmfs.noaa.gov/pr/pdfs/sars/po2007slca.pdf). The SAR of 2007 reports that the stock is not listed as "endangered" or "threatened" as defined by ESA, nor is the stock listed as "depleted" as defined by the U.S. Marine Mammal Protection Act of 1972 as amended (16 U.S.C. 1361 *et seq*.; MMPA). Because total annual rates of human-caused mortality are less than the calculated Potential Biological Removal (PBR), the stock is not considered "strategic" as defined by MMPA. The stock has been growing at a rate of 5.6% per anum in recent years. The minimum population estimate for the stock was 141,842 in 2005, the most recent year for which comprehensive field survey data are available.

b) Distribution: The U.S. stock of California sea lions ranges from the U.S.-Mexico border northward into Canada. The primary breeding locations for the stock are in the islands of southern California, in particular SNI and San Miguel Island.

c) Seasonal distribution: California sea lions are present in large numbers at breeding locations at all times of the year. Adult males are most abundant in spring and summer in association with the breeding season. During autumn and winter most adult males may disperse to distant locations, primarily to the north, in order to forage. Pups are born in late spring and early summer. Time to

weaning is variable and may extend to the following breeding season. The weaning process may be gradual, with pups learning to hunt and consume live prey while still nursing. Pups more than a few months of age are similar to adults in mobility, agility, and alertness to disturbances when hauled out.

Guadalupe fur seal:

a) Status: Guadalupe fur seals are observed at SNI only rarely, and only as scattered individuals. Those see at SNI are part of the single stock for the entire species, as defined by NMFS. The most recent NMFS SAR for Guadalupe fur seals is dated 15 December 2000 (www.nmfs.noaa.gov/pr/pdfs/sars/po2000segf-mx.pdf). The SAR of 2000 reports that the species is listed as "threatened" as defined by ESA, and both "depleted" and "strategic" as defined by MMPA. The species was growing at a rate of 13.7% per year in the most recent years for which data are available. The minimum population estimate for the species was 3,028 in 1993, the most recent year for which an estimate is available.

b) Distribution: Guadalupe fur seals range along the west coast of the U.S. and Mexico from 17º to 38º N latitude. The primary breeding locations for the species are at Isla Guadalupe and Isla Benito del Este, Mexico. Sightings of Guadalupe fur seals north of the U.S.-Mexico border are relatively rare, occurring mainly at San Miguel Island and SNI.

c) Seasonal distribution: Since 1980 all sightings of Guadalupe fur seals at SNI have been made during summer months coinciding with the breeding season.

Pacific harbor seal:

a) Status: Pacific harbor seals at SNI are part of the California stock, as defined by NMFS. The most recent NMFS SAR for the California stock of Pacific harbor seals is dated 1 November 2005 (www.nmfs.noaa.gov/pr/pdfs/sars/po2005sehr-ca.pdf). The SAR of 2005 reports that the stock is not listed as "endangered" or "threatened" as defined by ESA, nor is the stock listed as "depleted" as defined by MMPA. Because total annual rates of human-caused mortality are less than the calculated PBR, the stock is not considered "strategic" as defined by MMPA. Growth of the stock has been slowing in recent years, and the 2005 SAR indicates that the stock size may be stabilizing as a result of proximity to environmental carrying capacity. The minimum population estimate for the stock was 31,600 in 2004, the most recent year for which comprehensive field survey data are available.

b) Distribution: The California stock of Pacific harbor seals ranges from the U.S.-Mexico border northward to the Oregon-California border.

c) Seasonal distribution: Harbor seals are present at SNI during all months of the year. Pups are born during the period from middle February to early April, and are fully weaned and independent approximately two months after birth.

Northern elephant seal:

a) Status: Northern elephant seals at SNI are part of the California stock, as defined by NMFS. The most recent NMFS SAR for the California stock of northern elephant seals is dated 30 October 2007 (www.nmfs.noaa.gov/pr/pdfs/sars/po2007sene-ca.pdf). The SAR of 2007 reports that the stock is not listed as "endangered" or "threatened" as defined by ESA, nor is the stock listed as "depleted" as defined by MMPA. Because total annual rates of human-caused mortality are less than the calculated PBR, the stock is not considered "strategic" as defined by MMPA. The stock has been growing in recent years at rates as high as 11% per anum. The minimum population estimate for the stock was 74,913, based on data collected in 2005, the most recent year for which estimates are available.

b) Distribution: The California stock of northern elephant seals ranges from the U.S.-Mexico border northward to pelagic habitats off Alaska. Primary breeding locations for the California stock are at SNI and San Miguel Island off southern California, Año Nuevo Island off central California, and Pt. Piedras Blancas on the central California mainland coast.

c) Seasonal distribution: Northern elephant seals are present at SNI during all months of the year. However, northern elephant seals make two annual round-trip migrations per year between breeding locations and foraging locations, the latter in the pelagic north Pacific and Gulf of Alaska off Oregon, Washington, British Columbia, and Alaska. The migration schedule varies by age and sex category. Adult males arrive at SNI in late fall to establish breeding territories. Adult females arrive on the breeding Islands in early winter. Subadult animals also return to the Islands during the breeding season, although they do not actively participate in breeding. Pups of the year are born primarily in January and are fully weaned by the end of February, departing from breeding Islands for their first foraging trip during late winter and early spring. Breeding adults of both sexes depart breeding sites for foraging purposes in March. Prior to the onset of the next breeding season, all age and sex categories make a round trip from foraging habitats back to the breeding islands, then back again to foraging areas. The purpose of this second annual migration relates to the molting cycle of the seals. The timing of the second migration varies by age and sex. Adult males return to breeding islands for molting beginning in June and depart back to foraging areas in August. Adult females and juveniles return for the molt period beginning in mid-March and depart back to foraging areas in May. Finally, juveniles ranging in age from young-of-the year to four years return for an extended haulout period from September through November. This latter haulout period is not associated either with breeding or molt.

Southern sea otter:

a) Status: Sea otters present at SNI are part of the California stock (also known as the "southern sea otter"), as defined by the U.S Fish and Wildlife Service (USFWS). The southern sea otter currently is recognized as a distinct subspecies, *Enhydra lutris nereis* Wilson et al. 1991. The most recent SAR for the southern sea otter is dated December 2008 (www.nmfs.noaa.gov/pr/pdfs/sars/seaotter2008_ca.pdf). The SAR of 2008 reports that the southern sea otter is listed as "threatened" as defined by ESA. By default as a consequence of the ESA listing, the southern sea otter is also classified as both "depleted" and "strategic" as defined by MMPA. The minimum population estimate for the southern sea otter was 2,723 in 2008, the most recent year for which an estimate is available. By virtue of legal and legislative decisions dating to the USFWS relocation project of 1987-1991, the sea otters present at SNI are defined as a "non-essential experimental" colony. The U.S. Geological Survey reported that the sea otter colony at SNI numbered 42 animals in 2008 (http://www.werc.usgs.gov/otters/ca-surveys.html). A survey in spring 2011 indicated that sea otters at SNI number approximately 50 individuals (B. Hatfield, USGS, personal communication).

b) Distribution: Southern sea otters dwell in nearshore marine waters, ranging along the west coast of the California mainland from San Mateo to Santa Barbara Counties, and at SNI in Ventura County. Although hauling out on shore is common in Alaskan and Russian sea otter populations, it is generally uncommon among southern sea otters.

c) Seasonal distribution: Sea otters are non-migratory at the population level, although some individuals, particularly males, may make substantial within-range movements between preferred breeding areas and range peripheries on an annual basis. Pups may be born in any month of the year, but there is a recognizable peak in pupping during spring. Post-partum pup dependence averages about six months, and a consequent peak in weaning occurs in autumn.

(5) The type of incidental taking authorization that is being requested (i.e., takes by harassment only; takes by harassment, injury and/or death) and the method of incidental taking:

The applicants request authorization for incidental takes, by harassment only, of California sea lions, Pacific harbor seals, and northern elephant seals. Authorization for taking of Guadalupe fur seals and sea otters by harassment is not requested. Harassment will result when hauled marine mammals move to increase distance from persons involved in abalone surveys or related research on individual growth and movements, and relatedness as defined by genetic data. In no case will marine mammals deliberately be approached by abalone survey personnel. However, approach may be unavoidable if marine mammals are hauled out directly upon the permanent abalone study plots. In all such cases every possible measure will taken to select a pathway of approach to study

plots that minimizes the number of marine mammals harassed. Sites occupied by hauled Guadalupe fur seals or sea otters will be vacated without taking of the observed animals by harassment.

(6) By age, sex, and reproductive condition (if possible), the number of marine mammals (by species) that may be taken by each type of taking identified in paragraph (a)(5) of this section, and the number of times such takings by each type of taking are likely to occur:

Estimates are based on the maximum numbers of animals that could reasonably be taken by incidental harassment during one visit of four hours duration during a low tide period, for purposes of survey of local abalone populations in permanent study plots, at each of the study sites listed.

Using the data presented in Table 2 and assuming a maximum level of incidental harassment of marine mammals at each site during each visit, the applicants estimate that *maximum total possible* numbers of individuals disturbed by incidental harassment, resulting from one complete cycle of visits to permanent study sites used for black abalone study sites, would be as follows: 1,770 California sea lions, 75 Pacific harbor seals, and 525 northern elephant seals. As noted, sites occupied by Guadalupe fur seals or sea otters will be vacated immediately, and no taking of the latter two species is anticipated.

Data collected at SNI by applicant G. VanBlaricom during visits done under the auspices of previous Incidental Harassment Authorizations indicate that maximum possible levels of disturbance do not typically occur. Tables 3, 4, and 5 summarize total observed numbers of pinnipeds actually disturbed per visit at SNI, by year, under previous authorizations.

Table 5: Mean numbers of California sea lions actually disturbed per visit, by year and site, under previous Incidental Harassment Authorizations, in abalone survey study areas at San Nicolas Island, 2004-2009. All numbers are rounded to integer values.

Site	2004	2005	2006	2007	2008-9	Mean
1	25	74	8	59	43	42
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	47	1	0	2	0	10
5	89	1	5	43	42	36
6	143	364	80	146	217	190
7	345	162	386	160	214	254
8	75	73	154	121	93	103
9	0	0	0	1	2	1

Annual mean total for one visit cycle to all sites: 636
Proportion of estimated maximum potential numbers actually disturbed in one visit cycle: 0.32

Table 4: Mean numbers of northern elephant seals actually disturbed per visit, by year and site, under previous Incidental Harassment Authorizations, in abalone survey study areas at San Nicolas Island, 2004-2008. All numbers are rounded up to the nearest whole animal.

Site	2004	2005	2006	2007	2008	Mean
1	1	1	0	1	0	1
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	3	4	0	1	2
6	2	0	5	0	3	2
7	0	2	0	0	1	1
8	1	0	0	0	1	1
9	1	0	1	1	1	1

Annual mean total for one visit cycle to all sites: 8
Proportion of estimated maximum potential numbers actually disturbed in one visit cycle: 0.02

Table 5: Mean numbers of Pacific harbor seals actually disturbed per visit, by year and site, under previous Incidental Harassment Authorizations, in abalone survey study areas at San Nicolas Island, 2004-2008. All numbers are rounded up to the nearest whole animal.

Site	2004	2005	2006	2007	2008	Mean
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	21	25	25	15	21	21
6	26	34	13	27	12	22
7	3	3	0	3	7	3
8	0	0	0	0	0	0
9	0	0	0	0	0	0

Annual mean total for one visit cycle to all sites: 46
Proportion of estimated maximum potential numbers actually disturbed in one visit cycle: 0.51

Given the data in Tables 5, 6, and 7, and in consideration of our proposed plan for five visits to site 8, four visits to sites 5 and 7 respectively, and an expected mean of two visits each to sites 1, 4, 6, and 9, and unlimited visits to sites 2 and 3 during the period of the requested Incidental Harassment Authorization, we request permission to disturb by incidental harassment the following total numbers of pinnipeds during visits to black abalone study sites at SNI during the requested Authorization period:

California sea lions:	2,165
Pacific harbor seals:	140
Northern elephant seals:	25

Available data are not adequate to partition anticipated takes by age and sex within species. However, limitation of visits to sites 1, 5, 6, 7, and 8 to the period from the middle of October to the middle of February will reduce takes of dependent pups of California sea lions to low levels, and of dependent pups of Pacific harbor seals to zero. As noted previously, takes of northern elephant seal pups can be readily reduced to zero by avoidance of seal pups during approach to the study locations.

(7) The anticipated impact of the activity upon the species or stock:

In the opinion of the applicants, the proposed continuation of black abalone research at SNI will result in no detectable impact on California sea lions, Guadalupe fur seals, Pacific harbor seals, northern elephant seals, or sea otters at SNI, nor on stocks of any of the five species as defined by NMFS or USFWS (see above).

(8) The anticipated impact of the activity on the availability of the species or stocks of marine mammals for subsistence uses:

There is no anticipated impact of this kind. To the knowledge of the applicants, no subsistence harvest occurs for any of the species or species stocks that will be subject to incidental harassment as a result of the subject research on black abalone populations.

(9) The anticipated impact of the activity upon the habitat of the marine mammal populations, and the likelihood of restoration of the affected habitat:

There is no anticipated impact of the subject abalone research on the habitats of any of the species likely to be subject to incidental harassment as a result of the research activity.

(10) The anticipated impact of the loss or modification of the habitat on the marine mammal populations involved:

Not applicable. No impact on habitat is anticipated (see response to item 10 immediately above).

(11) The availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks, their habitat, and on their availability for subsistence uses, paying particular attention to rookeries, mating grounds, and areas of similar significance:

Methods and manner of effecting the least practicable adverse impact upon affected species at have been discussed in some detail above.

Summarizing, for California sea lions and Pacific harbor seals, possible adverse impacts are most effectively minimized by working at sites 1, 5, 6, 7, and 8 only during the period from about 15 October to 15 February. Guadalupe fur seals have been seen only at site 8, only during summer, and not at all in the ~25 year period since the middle 1980s. Sea otters have not been seen hauled out at any of the abalone study sites since being relocated to SNI from 1987 through 1991. Thus, limitation of visits to site 8 to the period from 15 October through 15 February eliminates the risk of taking of Guadalupe fur seals by harassment, and it appears currently that there is no risk of taking sea otters by harassment. It is the intention of applicant G. VanBlaricom to work at sites 1, 5, 6, 7, and 8 only during the period from 15 October through 15 February. During these visits care will be taken to search for Guadalupe fur seals and sea otters, and the visited sites will be vacated immediately if any Guadalupe fur seals or sea otters are sighted hauled out in or near abalone study areas. For northern elephant seals, possible adverse impacts can be minimized readily by avoiding the immediate proximity of hauled seals during approach to study areas, and during collection of data on abalone populations while at the study areas. It is the intention of applicant G. VanBlaricom to follow this protocol as well.

(12) Where the proposed activity would take place in or near a traditional Arctic subsistence hunting area and/or may affect the availability of a species or stock of marine mammal for Arctic subsistence uses, the applicant must submit either a "plan of cooperation" or information that identifies what measures have been taken and/or will be taken to minimize any adverse effects on the availability of marine mammals for subsistence uses:

Not applicable. The proposed activity will not take place near a traditional Arctic subsistence hunting area, nor will the proposed activity affect the availability of a species or species stock of marine mammal for Arctic subsistence uses.

(13) The suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species, the level of taking or impacts on populations of marine mammals that are expected to be present while conducting activities and suggested means of minimizing burdens by coordinating such reporting requirements with other schemes already applicable to persons conducting such activity. Monitoring plans should include a description of the survey techniques that would be used to determine the movement and activity of marine mammals near the activity site(s) including migration and other habitat uses, such as feeding. Guidelines for developing a site-specific monitoring plan may be obtained by writing to the Director, Office of Protected Resources:

All biological research activities at SNI are subject to approval and regulation by the NAWCWD Sustainability Office (SO), U.S. Navy, located at Naval Base Ventura County at Pt. Mugu, California. The U.S. Navy owns SNI, uses it for testing of various military capabilities, and closely regulates all civilian access to and activity on the Island, including biological research. At present, SO is the point of contact for biological researchers working at SNI.

Status and trends of pinniped aggregations at SNI, including California sea lions, Pacific harbor seals, and northern elephant seals are monitored primarily by staff of NMFS Southwest Fisheries Science Center, located in La Jolla, California. Monitoring work is based primarily on aerial surveys done under the direction of Mr. Mark Lowry. Mr. Lowry's work also includes ground surveys and scat collections to monitor and assess diet in California sea lions. In addition, long-term studies of pinniped population dynamics, migratory and foraging behavior, and foraging ecology at SNI are being done by Dr. Brent S. Stewart of the Hubbs-Sea World Research Institute (HSWRI), located in San Diego, California. Dr. Stewart's work is focused primarily on northern elephant seals and includes tagging of individual seals to measure survival rates and breeding success. Dr. Stewart and colleagues also monitor occurrences of Guadalupe fur seals at SNI.

During ongoing abalone research at SNI since 1979, applicant G. VanBlaricom has made a maximum effort to avoid contact with or immediate proximity to hauled pinnipeds in order to avoid taking of marine mammals by incidental harassment. Recognizing the need to avoid takes by incidental harassment, and recognizing the ongoing monitoring and research efforts by NMFS and HSWRI, it is VanBlaricom's opinion that his purposeful direct involvement in monitoring or research with pinnipeds at SNI is inappropriate and unwarranted. However, ongoing pursuit of abalone research by VanBlaricom's project at SNI can contribute to the general goal of improved monitoring and research of pinnipeds and sea otters at SNI in three specific ways:

1) Chance observations by VanBlaricom or his associates of unusual behaviors, numbers, or distributions of pinnipeds or sea otters at SNI can be reported to NMFS, HSWRI, and SO, such that any potential follow-up observations can be conducted by the appropriate personnel, under the auspices of appropriate permits, with coordination of activities through SO.

2) Chance observations by VanBlaricom or his associates of tag-bearing carcasses of pinnipeds or sea otters at SNI can be reported to SO, allowing transmittal of the information to appropriate agencies and personnel. In this way, any potential follow-up observations can be conducted by the appropriate personnel, under the auspices of appropriate permits, with coordination of activities through SO.

3) Chance observations of rare or unusual species of marine mammals occurring at or near SNI can be reported to SO, allowing transmittal of the information to appropriate agencies and personnel. In this way, any potential follow-up observations can be conducted by the appropriate personnel, under the auspices of appropriate permits, with coordination of activities through SO.

In addition, observations falling into any of the three categories listed immediately above can be described in annual reports to the NMFS Office of Protected Resources if so stipulated as part of the Incidental Harassment Authorization procedure. In the opinion of applicant G. VanBlaricom, activities by abalone research personnel directed toward

pinniped monitoring and research, beyond the three specific areas described immediately above, are either not feasible or not appropriate.

(14) Suggested means of learning of, encouraging, and coordinating research opportunities, plans, and activities relating to reducing such incidental taking and evaluating its effects:

Coordination with SO is clearly the appropriate avenue for ensuring that activities causing various kinds of taking of hauled pinnipeds or sea otters at SNI are coordinated, ensuring that the aggregate numbers of takes of pinnipeds at the Island are minimized. Applicant G. VanBlaricom is committed to honoring this process as a means of minimizing taking of pinnipeds or sea otters by incidental harassment. The applicant has a long-standing, positive, and effective professional relationship with SO staff, and there are no difficulties anticipated in this regard.

If so stipulated by the NMFS Office of Protected Resources, the applicant is willing to enter into a reciprocal agreement for information exchange with researchers at NMFS and HSWRI regarding coordination and scheduling of research activities at SNI. The primary purposes of such an agreement would be twofold. First, such an agreement would facilitate scheduling of abalone research activities such that associated incidental harassment of pinnipeds does not influence the quality of data collected by NMFS or HSWRI. Second, such an agreement would facilitate scheduling of research work by NMFS and HSWRI such that field activities would not be planned during periods of maximum daytime low tides, when abalone field work can be done with maximum efficiency and safety.

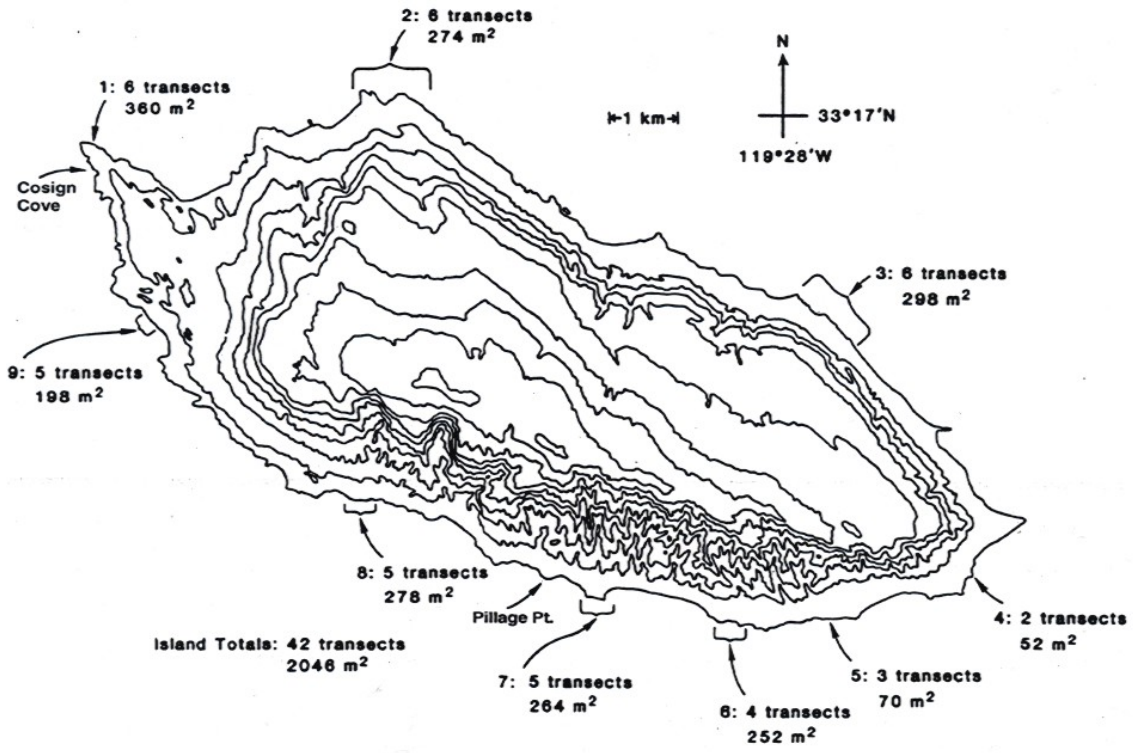

Figure 1. Map of black abalone survey sites on San Nicolas Island. The number of transects per site and total area surveyed are indicated next to the site number (after VanBlaricom 1993).

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