NOAA TECHNICAL MEMORANDUM
NMFS-SEFSC-384

Low-Level Monitoring of Bottlenose Dolphins, *Tursiops truncatus*, in Charlotte Harbor, Florida 1990-1994

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R. S. Wells, M. K. Bassos, K. W. Urian, W. J. Carr, and M. D. Scott

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National Marine Fisheries Service
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Low-Level Monitoring of Bottlenose Dolphins, *Tursiops truncatus*, in Charlotte Harbor, Florida, 1990-1994
Final Report, NMFS Contract 50-WCNF-0-06023

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Executive Summary

The National Marine Fisheries Service (NMFS) has recognized a need for low-level monitoring of bottlenose dolphin stocks in southeastern U.S. waters, designed to detect catastrophic changes in the stocks. The main goals of the monitoring are detection of large-scale changes in dolphin abundance and establishment of archival databases for long-term trend detection. Low-level monitoring can provide a short-term means of detecting large-scale changes in population abundance and give decision makers the information necessary to determine if modification of management plans is necessary. To these ends, the NMFS has funded several local research efforts in the southeastern U.S., including the photographic identification effort in Charlotte Harbor, Florida, reported here. Charlotte Harbor was of interest to management agencies at least in part because of the use of this region from the 1960's through the 1980's for commercial dolphin collection. More recently, Charlotte Harbor has been designated as a National Estuary under the Clean Water Act.

Our Charlotte Harbor study area included the inshore waters from Lemon Bay southward to northern Pine Island Sound on the central west coast of Florida. Photographic identification surveys were conducted through the study area on an average of 24 boat-days in August of each year from 1990 through 1994. Mark-resighting analyses modeled after a comparable study in Tampa Bay during 1988-1993 allowed estimation of abundance and natality, analysis of inter-year trends, and evaluation of seasonal residency. Our Charlotte Harbor photo-ID catalog for 1990-1994 included 411 different dolphins.

During August of each year from 1990 through 1994, an average of about 308 dolphins used the Charlotte Harbor study area. The abundance apparently increased from 198 - 369 (95% CLs) in 1990 - 1992 to 315 - 463 in 1993 - 1994. Part of this increase appeared to be due to an increase in reproduction. The average natality across the study years was 0.034, but a peak of 0.050 was reached in 1993. The increase in the proportion of calves from 0.120 in 1990 to 0.210 in 1993 and 1994 suggests the successful recruitment of many of the young-of-the year. It was not possible to calculate rates of immigration or emigration. Evidence from the high proportion of animals present in multiple years and the absence of documentation of unidirectional movements between Charlotte Harbor and other adjacent and distant contiguous study areas along the central west coast of Florida indicate that permanent immigration and emigration appear to be rare events. About 9% of the

dolphins appeared to be transients. Immigration, emigration, and transience are not major influences on the number of animals present at any given time, but they may be important ecologically by providing a means of genetic exchange between populations, as demonstrated for the Sarasota dolphin community and for Tampa Bay. It was not possible to calculate a meaningful mortality rate, but stranding data mirrored patterns of mortality reported from other parts of the central west coast of Florida during the same period.

We attempted to summarize the components of the interannual differences in abundance estimates. It appears that the increase in abundance from 1992 and 1993 may be attributed to a return to presumably normal mortality after high mortality the previous year, a higher-than-normal number of young-of-the-year recorded, a higher-than-normal number of calves recorded after a relatively low number recorded the previous year, and a higher-than-normal number of residents recorded in the area (due to increased movement into the area or more effective photographic effort). These data suggest that conditions in the area improved in 1993, particularly in comparison to 1992, with relatively high recruitment and possibly site fidelity, and improved survivorship.

A number of recommendations were made as a result of the findings of this project. We recommend that monitoring be continued at least annually to track and evaluate the apparent trend. More-intensive surveys would permit more-refined determinations of natality, immigration, emigration, transience, and mortality. Although two or three annual surveys can detect large trends in abundance, this study illustrates the difficulty of interpreting the causes for the abundance changes without more detailed or longer-term information. Photo-ID work should be expanded to other seasons to examine previous reports of seasonal fluctuations in abundance. Empirical studies designed to identify the appropriate level of effort for mark-recapture surveys should be conducted. Photo-ID efforts should be expanded to greater distances offshore and along the coast to examine immigration, emigration, and transience in greater detail. Patterns of habitat use in Charlotte Harbor should be examined through integration of GIS habitat data with our sighting data. Efforts should be made to integrate ecological studies of the dolphins of Charlotte Harbor with other research efforts under the National Estuary Program. Dolphin community structure needs to be examined in more detail to define biologically meaningful management units. Existing information on residency, ranging and social patterns, and genetics should be integrated to arrive at population designations. Analysis of community structure is necessary to interpret immigration, emigration, and transience relative to population size. Sample sizes for examination of mt-DNA haplotype distributions in Charlotte Harbor should be augmented through biopsy darting or capture-release efforts. The genetics data should be supplemented with telemetry data on movements and additional photo-ID efforts. A correlation between increases in the number of dolphin strandings and the occurrence of red tide blooms suggests that further investigation into the role of red tide in dolphin mortality may be warranted.

Introduction

The National Marine Fisheries Service (NMFS) is responsible for establishing quotas for take of bottlenose dolphins (*Tursiops truncatus*) and for monitoring the populations of dolphins in the southeastern United States waters. Quotas have been based on a rule-of-thumb developed by the Marine Mammal Commission in which the annual quota has been set at 2% of the estimated dolphin abundance for a geographical location. Most of the live-capture fishery for bottlenose dolphins has occurred in the coastal Gulf of Mexico and the Florida east-coast waters. In recent years, large scale mortalities of bottlenose dolphins have occurred in several locations in southeastern U.S. waters. The NMFS completed sampling surveys in these areas for abundance estimation, and recognized a need for low-level monitoring of bottlenose dolphin stocks in southeastern U.S. waters, designed to detect catastrophic changes in the stocks. The main goals of the monitoring were detection of large-scale changes in dolphin abundance and establishment of archival databases for long-term trend detection. Low-level monitoring could provide a short-term means of detecting large-scale changes in population abundance and give decision makers the information necessary to determine if modification of management plans is necessary. To these ends, in 1987 the NMFS began funding several local research efforts in the southeastern U.S. with the following stated objectives:

1) Detection of large-scale (halving or doubling) interannual changes in relative abundance and/or production of the bottlenose dolphin stocks in the southeast U.S. The population rate parameters of relevance include: a reliable index or estimate of local relative abundance, natality, mortality, emigration, and immigration.

2) Establishment of archival databases for long-term trend detection in localized geographical regions around the southeast US.

One of the regions selected by the NMFS for low-level monitoring was Charlotte Harbor, along the southwestern coast of Florida. Charlotte Harbor was of interest to management agencies at least in part because of the use of this region for commercial dolphin collection. In addition to those removed by several active collectors prior to regulation under the Marine Mammal Protection Act of 1972 (R. Wells, pers. obs.), 43 dolphins were collected from these waters during 1973-1988 (Scott 1990). More recently, Charlotte Harbor has been designated as a National Estuary under the Clean Water Act.

Aerial surveys to estimate bottlenose dolphin abundance in Charlotte Harbor have been conducted on four occasions since 1975: by Odell and Reynolds (1980) during 1975-76, and by the National Marine Fisheries Service during 1980-81, 1983-1986, and 1994 (Thompson 1981; Scott *et al.* 1989; Blaylock *et al.* 1995). The aerial survey study area included Charlotte Harbor proper, as well as Pine Island Sound to

This study area was selected in part because of its proximity to the long-term Sarasota study site (Scott *et al.* 1990b; Wells 1991). Preliminary studies indicated that a number of distinctively marked dolphins inhabited the region, and at least some were present over a number of years (Irvine and Wells 1972; Wells 1986). The photo-ID research being conducted in the Sarasota (ongoing) and Tampa Bay (through 1993) waters to the north facilitated examination of immigration and emigration. Inclusion of the Charlotte Harbor study area completed a nearly 200 km long section of contiguous coastline for which movement patterns of bottlenose dolphins could be determined.

The Charlotte Harbor study area provided a unique opportunity for comparison with population rate parameter data collected from the Sarasota study area. Strong similarities among the areas allowed some measure of control for the effects of habitat on population parameters. The Charlotte Harbor study area is a mirror image of the Sarasota study area, in terms of geography. Physiographically, the areas are nearly identical, with bays of shallow seagrass meadows separated from the Gulf of Mexico by long, narrow barrier islands. The bays communicate with the Gulf through narrow passes. Each study area opens at one end into a large deep-water, estuarine embayment, and each is restricted at the opposite end to a narrow, artificially-maintained waterway. Both areas are of similar size. The Charlotte Harbor area is much more nearly pristine than the Sarasota area, however.

We have divided the 701-km^2 study area into five regions for assessment of survey effort (Figure 1). Regions were identified by physiographic and effort criteria. Because of the distances of some parts of the study area from our field stations, it was not possible to survey all of Charlotte Harbor with uniform effort. The segmentation was done in order to be able to quantify effort in different parts of the study area in an attempt to make the within-region effort comparable across years.

The northernmost section, Region 1, includes Lemon Bay, a shallow bay with a narrow dredged Intracoastal Waterway (ICW) channel and Stump Pass, a variably navigable inlet from the Gulf of Mexico. Water depths range from less than 1 m nearshore to 6 m in the Pass, but generally waters were 2 m or less. Coastal development, primarily residential, was greater in this region than in all others. Region 2 included Gasparilla Sound, Placida Harbor, Gasparilla Pass, and Bull and Turtle Bays. Waters were generally less than 2 m deep, except for the dredged ICW channel and a basin in Gasparilla Sound, where depths ranged up to 3 m, and Gasparilla Pass, where depths reached 7 m. Bull and Turtle Bays are very shallow, undeveloped, mangrove-fringed bays with extensive coverage by seagrass meadows. Between these bays and Charlotte Harbor to the south is a wide band of shallow waters, less than 2 m deep. Coastal development in this region in general is intermediate between Region 1 and the remaining regions. The next section to the south, Region 3, includes a large inlet, Boca Grande Pass, and the open waters of Charlotte Harbor proper, along with the shallow southeastern coastal waters. Boca Grande Pass is the primary connection between Charlotte Harbor and the Gulf of Mexico, with depths of up to 24 m. Charlotte Harbor is about 3 m to 7 m deep through its east-west axis, with fringing shallows of less than 2 m. Region 4 is the continuation of Charlotte Harbor to the north and east, to the mouths of the Peace and Myakka Rivers. The open waters of the north-south axis of Charlotte Harbor are generally 3 m to 7 m deep, with fringing shallows of less than 2 m depth. Freshwater inflow from the rivers varies seasonally, but continues year-round. Little development is evident except at the mouths of the rivers, especially the town of Punta Gorda on the Peace River. Region 5 includes the shallow waters to the south between Charlotte Harbor and Pine Island Sound. This region includes numerous sandy shoals and small mangrove islands, with channels through some of the shoals and seagrass meadows. Depths average less than 2 m in most areas, ranging up to 3 m to 4 m in the channels. Low levels of residential development occur on some of the islands.

Survey Schedule

A two- to three-week window during August was selected to provide ample opportunity to fully survey each region of the study area at least three to five times. This timing was selected for several reasons. Late summer historically brought a period of calm weather, providing a window of favorable survey conditions before the cold fronts begin to penetrate southward into central Florida. The timing was also considered to be advantageous for natality estimates. In adjacent waters to the north, most of the year's calves were born by late summer (Wells *et al.* 1987; Urian *et al.* in press). Based on an assumption of similar patterns of reproductive seasonality, it seemed that a late summer survey would provide the best estimate of numbers of calves born during that year (young-of-the-year).

Additional information on the occurrence of identifiable dolphins in Charlotte Harbor was provided by occasional surveys during other times of the year. Data from outside of the NMFS survey period each year were not included in quantitative analyses for this report, but provided perspective.

Field Techniques and Logistics

Surveys were conducted from 6-7-m outboard-powered boats. Two or, during later years, three boats were used during each survey. Each boat was equipped with a VHF radio, depth sounder, compass, thermometer, and eventually a hand-held LORAN. Survey crews ranged in size from two to six people per boat. Survey routes were selected each day based on predicted weather conditions and the status of survey coverage. While searching for dolphin schools, the boats were operated at the slowest possible speed that would still allow the vessel to plane, typically 33 to 46 km/hr, depending on the vessel. Once schools were encountered, the boats were slowed to match the speed of the dolphins and moved parallel to the schools to obtain photographs.

Every dolphin school encountered along a survey route was approached for photographs. We remained with each dolphin school until we were satisfied that we had photographed the dorsal fin of each member of the school, or until conditions precluded complete coverage of the group. A suite of data including date, time, location, activities, headings, and environmental conditions were recorded for each sighting. Numbers of dolphins were recorded in real time as minimum, maximum, and best point estimates of numbers of total dolphins, calves (dolphins $\leq$ about 80-85% adult size, typically swimming alongside an adult), and young-of-the-year (as a subset of the number of calves). A young-of-the-year is defined as a calf in the first calendar year of life and is recognized by one or more of the following features: (1) small size; 50%-75% of the presumed mother's length, (2) darker coloration than the presumed mother, (3) non-rigid dorsal fin, (4) characteristic head-out surfacing pattern, (5) presence of neonatal vertical stripes, (6) consistently surfacing in "calf position" alongside the dorsal fin of the mother. The specific parameters recorded are defined, and a sample data sheet is presented, in the Appendices 1 and 2.

We used Nikon camera systems (FE, F3, 2020, 8008) with zoom-telephoto lenses, motor drives, and data backs to photograph each school. Over the course of the project, longer lenses (up to 300 mm) and auto-focus cameras and lenses were incorporated, resulting in improved photo quality, and decreasing the time required to obtain satisfactory photographic coverage of each group. Kodachrome 64 color slide film was used throughout the surveys. The fine grain of this film provided excellent clarity for resolution of fin features. Color film allowed evaluation of the age of some wounds and fin features.

The survey team was based on Don Pedro Island, at the southern end of Lemon Bay, near the southern extent of Region 1. This field station was 42 km from the farthest edge of the study area in Region 4, 32 km from the most distant point in Region 5, and 23 km from the most distant point in Region 6. The long distance and the large areas of exposed waters in Charlotte Harbor meant that the boats often faced abrupt changes in weather conditions and sea states during any given day, at times preventing us from reaching or adequately covering some regions. To facilitate access to the more distant regions, we began using a third boat in 1993 to reduce the time required to cover these areas.

Photo-Identification Catalog

The patterns of nicks, notches, and scars on the dorsal fin and visible body scars have been used successfully in numerous studies of bottlenose dolphins to identify individuals over time (Scott *et al.* 1990a; Würsig and Jefferson 1990). Our photographic catalog is based on exclusive categories that classify individuals with similar features together. Each of the 12 categories of the catalog is based on: (1) the division of the trailing edge of the dorsal fin into thirds and distinctive features located in each third; (2) distinctive features on the leading edge of the fin; (3) distinctive features on the anterior portion of the peduncle and (4) evidence of permanent scarring or pigmentation patterns on the fin or body.

The primary photo-ID catalog is composed of the most diagnostic and best quality original slides of each animal, filed alphabetically by each individual dolphin's unique four-character code. Prints are made from the original slides and filed in a working catalog used for initial searching for matches. A duplicate catalog made from color photocopies of the color prints is maintained off-site as a backup copy. We maintain three photo-ID catalogs that represent our different study areas: the Sarasota Bay region, Charlotte Harbor, and Tampa Bay and the inshore waters of the Gulf of Mexico. The catalog used for these analyses is a subset of a larger catalog incorporating dolphins sighted outside of the limited Charlotte Harbor region considered for this report. All catalogs are ultimately searched before an addition is made to the appropriate catalog.

The photo-ID catalog for the 1990 - 1994 surveys included 16 dolphins first identified from the Charlotte Harbor study area during 1982 through 1989. We collaborated with Dr. Susan Shane in examination of 272 identification photographs taken by her in Pine Island Sound during her behavioral studies (Shane 1987, 1990a,b). Examination of these photographs resulted in 24 matches with animals in our identification catalogs for all areas, including 12 matches with our Charlotte Harbor catalog. As of September 1995, there were 2,247 dolphins (1,870 distinctive non-calves) in the DBRI photo-ID catalogs for all study areas, including Charlotte Harbor.

Analysis of Photographs

Photographic slides are labeled with information from the corresponding sighting: date, film roll number, sighting number, and location code. Labeled slides are filed chronologically in archival-quality storage pages in binders. Comments from sighting data sheets are read for clues and additional information to assist in identification of animals (for example, distinctive features noted in the field, or features distinguishing between two similar animals). Each slide is examined using a 15-power lupe eyepiece to find all distinctive dolphins. Slides are sorted by each identifiable individual within a sighting and the best-quality slides of each animal showing the distinctive features of the fin are selected to compare with the photo-ID catalog.

The most prominent feature of the fin is identified and the category that best describes that feature is searched for a potential match. Matches are often made by comparing the slide directly to the print in the catalog. However, with a close match or to distinguish between fins with similar features, the original slide is used for comparison. To verify a match between similar fins, both fins are projected using a slide projector with a zoom lens and traced to line up distinguishing features. To confirm long-term, long-distance, or difficult matches, three experienced photo-ID researchers examine the potential matches and must vote unanimously on the final match. When a match is made with a fin in our catalog, all slides are labeled with the dolphin's unique 4-character code and its name, and the dolphin is scored as a positive identification.

When a match is not found in the first category searched, all other possible categories are searched to account for dolphins that have multiple identifying characteristics. The entire catalog is searched before a new animal is added to the catalog. If we are confident the fin is reliably recognizable, the dolphin is given a name that describes the most obvious feature of the fin and a unique 4-character code that abbreviates the name is selected. To be considered a catalog-quality image, a new entry into the catalog must meet the following criteria: the entire fin, from the anterior insertion to the posterior insertion of the dorsal fin and the trailing edge of the fin must be visible, the image must be in focus and perpendicular to the photographer, and, when available, both right and left side images of the fin are selected for the catalog. The best-quality slide is labeled with the name, code, and catalog category that describes the most prominent feature of the fin. A print is made and added to the print catalog and the original slide is filed alphabetically in the slide catalog.

An animal was occasionally "visually confirmed" in the field when it was recognized because it was familiar to an observer and it was counted as a positive identification for photo-analysis even though it may not have been documented photographically.

For photo-analysis, a calf or young-of-the-year is considered positively identifiable only if it can be recognized because of distinctive features that make it identifiable independent of its mother. A small animal that appears in all slides next to a larger animal in the "calf position," (i.e., alongside and slightly behind the presumed mother), is assumed to be a calf. If the calf is with an identifiable mother, but the calf is not distinctive, it is not scored as a positive identification.

In some cases it is possible to identify animals in a sighting that are not sufficiently distinctive to make long-term matches, or appear distinctive but are unidentifiable because the entire fin is not visible, photo coverage is incomplete, or photo quality is substandard. Each of these dolphins is classified as an "other..." with some reference to the most distinguishing feature. Although it is not considered a positive identification, an "other..." dolphin is counted toward revision of the group-size estimates.

Fins that lack distinctive markings are considered "clean" but may also be used in calculating or adjusting group size estimates. In some cases, "clean" fins may be distinguished from one another within a sighting based on differences in fin shape. This minimum count of "clean" fins is added to the positive identifications and "other" fins to calculate the minimum, maximum, and best group size estimates. Thus, the minimum estimate is a minimum count of distinguishable fins within a sighting.

A grading system that integrates recognizability, photographic quality, and coverage is used to identify the quality of a given sighting:

Grade-1 - All dolphins in the group were photographed or otherwise positively identified. All the animals in the best field estimate are accounted for as a) confirmed positive identifications; or b) as individuals that can be distinguished within a sighting from a high quality photograph but do not warrant status as a 'marked' dolphin in the catalog.

Grade-2 - There are photographs of some dolphins with distinctive fins that may be in the catalog, but because of the quality of photographs it is not possible to make appropriate comparisons with the catalog and make a match or assign an identification.

Grade-3 - Photographic coverage is known to be incomplete, because all dolphins were not approached for photographs, no photos were taken, film did not turn out, sighting conditions were poor, etc.

Data Processing

Sighting data and results from photo-analysis are entered into the Dolphin Biology Research Institute (DBRI) database. As of September 1995, the database includes 10,307 sighting records of dolphin groups from Sarasota Bay, Tampa Bay, Charlotte Harbor and the inshore Gulf waters from 1975 through 1994. We use the FoxBase+/Mac Version 1.1 relational database management system containing dBase programming language that permits us to write specific programs to manipulate the database. A Macintosh IIsi computer is used for data entry and a Macintosh Centris 650 computer is used primarily for data manipulations.

We defined our dataset based on temporal and geographic criteria. We included sightings collected during the August surveys of 1990, 1991, 1992, 1993, and 1994 within the designated boundaries considered to comprise Charlotte Harbor (Figure 1).

Group size estimates were derived from adjustments of field estimates based on photo-analysis (see Appendix 2). Minimum, maximum, and best field estimates were increased if the sum of the number of positively identified individuals plus the number of "other..." dolphins, plus the number of "clean" dolphins exceeded the original field estimates. The resulting revised minimum, revised maximum, and final best estimates were used in all calculations involving group size.

Several of the abundance and trend estimates and the power analyses were conducted at the Inter-American Tropical Tuna Commission with a VAX 3100/80 micro-computer and a 486 IBM-compatible personal computer. Linear regressions were performed using a SAS procedure (SAS 1989). A FORTRAN program designed for use on IBM-compatible personal computers (TRENDS2; Gerrodette 1993) allowed us to conduct a power analysis to detect trends in abundance (Gerrodette 1987).

Estimation procedures: Abundance

The basic questions considered by this project were: "How many dolphins use the Charlotte Harbor study area during the August survey period, and how does this number vary from year to year?". A closed population was assumed because of the brief period during which the surveys took place each year. There are a variety of ways to calculate indices of abundance of bottlenose dolphins inhabiting Charlotte

Harbor. We followed the analytical procedures of Wells *et al.* (1995) as applied to bottlenose dolphins in Tampa Bay during a similar study.

Method 1 (catalog-size method) simply involves tallying the number of positively identified ("marked") individuals (M) sighted within the study area during the survey period. We derived our overall catalog of marked animals for each survey year by considering all sightings during the survey period regardless of the photo grade. The inclusion of a fin in the catalog was dependent on the recognizability of a dolphin, not the overall quality of coverage of a sighting. The catalog-size method does not account for dolphins that are not distinctively marked. The size of the annual Charlotte Harbor catalog (M) is an integral part of each of the following three abundance estimation procedures.

Assuming comparable levels of sighting effort from year to year, the catalog-size approach may provide a reasonable index for detection of trends of abundance. To conduct a power analysis, however, a coefficient of variation ($CV = var^{1/2} / N$) could only be calculated by considering each year (1990-1994) as a replicate sample. A regression analysis of the five annual estimates was conducted to remove the effects of a potential trend; a CV was then calculated from the residuals.

Method 2 (mark-proportion method) calculated the proportion of positively identified dolphins (m) relative to the total group size (n) in each sighting of "Grade-1" quality. The accuracy of the population-size estimates depends on the confidence in identifications. Therefore, only Grade-1 sightings were used to derive the proportion of marked animals. There was no relationship between group size and the proportion of dolphins identified ($r^2 = 0.002$).

The proportions of marked dolphins to group size (m/n) for each sighting were averaged for each year. The total number of marked dolphins in the catalog for a given year (M) was divided by the average proportion of marked dolphins to yield an annual population estimate (N). A similar method was used by Shane (1987) to estimate abundance in Pine Island Sound. A 2000-replicate non-parametric bootstrap resampled the m/n proportions from observed groups to produce variance estimates and percentile confidence limits.

Method 3 (mark-resight method) uses the Bailey modification of the Petersen method to estimate abundance (Bailey 1951; Seber 1982; Hammond 1986). The Bailey modification incorporates resampling with replacement in the model. Because both marked and unmarked dolphins may be resighted multiple times, this modification was deemed appropriate. The equation used was:

$$N = M (n_2 + 1) / (m_2 + 1)$$

with a binomial variance of

$v = M^2 (n_2 + 1)(n_2 - m_2) / (m_2 + 1)^2 (m_2 + 2)$

where N is the population size, M is the total number of different marked dolphins sighted during the year, n_2 is the total number of dolphins sighted during all complete surveys of the area, and m_2 is the total number of marked dolphins sighted during the same surveys. A complete survey consisted of a combination of daily surveys that covered all of the regions (Figure 1) once during good or excellent sighting conditions. These combinations were developed *a posteriori* for the purpose of testing this estimation technique. Each "complete survey" required three to six boat days over periods of three to fifteen days for completion due to the large area to cover and the incidences of poor weather conditions. Only "Grade-1" sightings were used to ensure that all marked dolphins present during these sightings were identified and the group size was accurately counted. Because of the difficulties of covering such a large area, only 2-3 complete surveys were conducted each year. CVs were calculated from binomial variance estimates.

Method 4 (resighting-rate method) attempts to first estimate the number of unmarked dolphins (u) in the area and then add them to the number of marked dolphins in the catalog sighted that year (M) to estimate N. By assuming that unmarked dolphins are resighted at the same rate as marked dolphins, the following equation would estimate the number of unmarked dolphins:

$$u = (M/m_2)(n_2 - m_2)$$

where M is the number of different marked dolphins sighted during the annual survey period, n_2 is the total number of dolphins counted from "Grade-1" sightings during the annual survey period, m_2 is the total number of marked dolphins counted from "Grade-1" sightings during these same sightings, n_2-m_2 is the number of unmarked dolphins counted from these sightings, and M/m_2 is the proportion of the number of marked individuals to the number of sightings of these marked individuals. The population size is then estimated by

$$N = M + u$$

and a CV was estimated by the regression analysis described in Method 1.

Estimation procedures: Interannual Trends and Power Analysis

Linear regression analyses were conducted to determine whether a trend was present in the indices or estimates of abundance (i.e., the slope of the regression line of abundance vs. year was significantly different from zero).

We used a power analysis to calculate the number of surveys or the CVs of the estimates required to detect a trend (Gerrodette 1987). The power analysis relates five parameters: alpha (the probability of making a Type-1 error, i.e. concluding that a trend exists when in fact it does not), the power, or 1 - beta (beta is the probability of making a Type-2 error, i.e. concluding that a trend does not exist when in fact it does), n (the number of surveys), r (the rate of change in population size), and the CV of the abundance estimate. Additionally, one must choose whether a t- or z-distribution and a one- or two-tailed test is appropriate, and whether r changes exponentially or linearly. It is also necessary to determine whether the CV is constant with abundance, the square root of abundance, or to the inverse of the square root of abundance. Notice that the actual estimate is not used, only the coefficient of variation of the estimate. This estimate can be the actual abundance (population size as determined from mark-resight methods or censuses) or indices of abundance (such as total number of marked animals in the photo-ID catalog for a particular year, or total number of dolphins sighted per survey or time period).

One of the objectives of this research was to determine whether the photo-ID method could detect a doubling or halving of population size with 80% certainty. Thus, alpha = 0.05, beta = 0.20, power = 0.80, r = 1.00 or -0.50, n = 2 annual surveys, and it is only necessary to calculate the CV required to detect a trend and compare it with the CV of the abundance estimate calculated from the data. Alternatively, one can use the CV of the estimate to solve for n, the number of surveys necessary to detect the trend. In general, the lower the CV, the fewer the number of surveys required to detect a trend (Gerrodette 1987). For mark-resight estimates, the CV decreases as the proportion of marked animals in the population increases (Wells and Scott 1990).

Traditionally in research, one is concerned mainly with alpha and Type-1 errors. This is conservative when considering whether to accept an alternate hypothesis as truth or not, but may not be conservative from a management point of view. Such a case might occur when the null hypothesis that a population is stable is accepted when, in fact, it is declining (Type-2 error). Gerrodette (1987) applied power analysis to linear regressions of abundance. Because the question posed is whether a large change can be detected from one year to the next, and because we used an annual survey period as the sampling unit, the sample size (n), equals two. A linear regression is not feasible with only two data points, so it is necessary to compare two distributions presumed to have known variances rather than use a linear regression (TRENDS2 does this automatically).

Given the initial parameters specified by the NMFS (alpha = 0.05, power = 0.80, r = 1.00 or -0.50, and n = 2), one can calculate the CV necessary to detect trends in abundance. We used a 1-tailed t-distribution for the TRENDS2 program, and specified that rates of increase or decrease be exponential. We made this choice because an exponential function is more typical of biological processes and because detecting a 50% linear decline is a moot exercise given that the population would be reduced to zero at the end of the second year. TRENDS2 also requires that the model of the relationship between CV and abundance be specified. As suggested by Gerrodette (1987) and a graph of our data, the "CV proportional to the square root of abundance" option was selected. Given these parameters, a maximum CV of 0.05 is required to detect an increasing trend and a CV of 0.07 is required for a decreasing trend.

Assuming that the calculated estimates and variances are the true population parameters, then a less conservative z-distribution can be used and the maximum CVs would be 0.16 (increasing trend) and 0.23 (decreasing trend). Conversely, if a more-conservative 2-tailed test were used, the maximum CVs would be 0.02 (increasing trend) and 0.03 (decreasing trend). We chose the 1-tailed t-distribution option because it better fits the situation of considering a change in only one direction at a time and because it could be argued that calculated variances may not truly represent those of the population.

Estimation procedures: Natality

Natality was calculated as the proportion of dolphins in each sighting considered to have been born within the calendar year. Though the total number of calves was recorded for each group sighted, only the subset of calves considered to be young-of-the-year was considered to be relevant to the measurement of natality (Wells and Scott 1990). The average proportion of young-of-the-year was calculated for each year.

Estimation procedures: Mortality

We obtained stranding records from the Southeast U.S. Marine Mammal Stranding Network (D. Odell, pers. comm.) for bottlenose dolphins recovered from southern Sarasota, Charlotte, and Lee counties from 1979 through 1994 to estimate a minimum mortality rate for the Charlotte Harbor area. We examined photographs of dorsal fins of carcasses provided by Bob Wasno of the Lee County Department of Community Services, Tom Pitchford of the Florida Department of Environmental Protection, and Mote Marine Laboratory's Marine Mammal Stranding Program. We used photographs of animals that died during the period 1990 through 1995 and were recovered within the counties encompassing the Charlotte Harbor study area. Stranding records from outside our specified study area may be included because the exact locations of strandings within Lee County were not available and Lee County waters extend beyond our Charlotte Harbor study area. Photographs of the stranded animals were examined to determine if the markings occurred post-mortem or if decomposition obscured recognition.

Estimation procedures: Immigration/Emigration/Residency/Transience

We were unable to calculate rates of immigration and emigration for the dolphins in Charlotte Harbor, because the criteria we have used in other areas (eg., Tampa Bay, Wells *et al.* 1995) were too restrictive for use in this project. To calculate a rate of immigration, we needed to identify "permanent" movement into or out of the study area during our survey period. "Permanent" is defined as being present or absent for a period of at least two consecutive years (Wells and Scott 1990). For an immigrant, we would have to document that the animal was not present for at least two years prior to its first appearance in the catalog, and that it was seen in the study area during each subsequent survey session (for at least two years). Thus, by definition an immigrant would have to be absent during 1990-1991 (to clearly establish its prior absence), first identified in 1992 (its year of immigration), and present during 1993-1994. Similarly, an emigrant would have to demonstrate its presence by being seen since the beginning of the study and for at least two consecutive years before disappearing, and remaining absent for at least two years. Given these restrictions, the only year for which such analyses would be possible was 1992. This is the year for which we have the least data available, due to Hurricane Andrew bringing our field season to a premature close. In the absence of meaningful quantitative measures of immigration and emigration, we provide qualitative descriptions of residency and movements between study areas, and we present quantitative estimates of transience.

Marked dolphins were considered to be "residents" during the survey season if they were identified in at least four of the five survey years. It must be recognized that this definition of residency is limited; the repeated occurrence of these animals during our surveys does not necessarily indicate a year-round presence.

The incidence of transience was estimated by identifying individuals that were sighted in only one year of the five-year survey period and had no other sighting records in the DBRI database. The incidence of transience was calculated as the proportion of individuals that met the criteria above relative to the total catalog size for each survey year. This rate is probably an overestimate because it may include dolphins that in fact are not transients, but were missed during other surveys, died, or their fins changed without being detected.

Results

Survey Effort

Surveys were conducted during windows of 10-18 days each year (Table 2). The size of the window each year depended on weather and the number of boats available. Weather, including Hurricane Andrew in 1992, adversely affected survey schedules. During the first years of the project, only two boats were used, but in 1993 and 1994 three boats were used. Survey effort was measured in two ways. One measure was a count of the number of boat-days. A boat-day was scored when a boat left the dock to search for dolphins. On average, 24 boat-days were spent in the study area each year (range = 16-28 days, Table 2). A more refined measure of survey effort is the number of linear kilometers covered by our survey boats searching for dolphins within the study area. The total number of kilometers surveyed while "on-effort", (under excellent, good, or fair survey conditions, see appendix) are summarized in Table 2, and are presented by region to allow a comparison of within-region effort across years. Differences across years reflect the effects of weather, and the use of variable numbers of boats.

Dolphins were seen throughout the study area, but they were not uniformly distributed. Larger groups tended to be found in the more open and deeper waters

(Figures 2a-e). The total number of sightings and dolphins seen each year closely track the level of survey effort (Figure 3). On average, six or seven photographs per dolphin were taken each year. These results compare favorably with those of the Tampa Bay survey project (Wells, *et al*, 1995).

Photo-ID Catalog Development

The level of survey effort was considered sufficient to warrant generation of abundance estimates based on mark-resighting analyses. This conclusion was supported by the high proportion of identifiable dolphins in the population (58% to 80%, Table 3), and the frequency distribution of resightings of identifiable dolphins within survey years (Figures 4a-e). About one quarter of the dolphins were sighted at least twice during a given survey year, up to a maximum of 8 times each.

Our Charlotte Harbor catalog for 1990-1994 included 411 different dolphins. The catalog size provides a minimum population estimate for the Charlotte Harbor study area ranging from 165 identifications in 1992 to 243 in 1994. On average, 55% of the dolphins in an annual catalog were also seen in either the previous or subsequent year, 51% were seen two years earlier or later, 51% were seen three years earlier or later, 50% were seen four years earlier or later (Table 4).

Photographs taken during the 1990-1994 NMFS surveys built upon an existing Charlotte Harbor catalog initiated in 1982 (Figure 5; Wells 1986). Of the animals identified prior to the initiation of the surveys, 16 individuals were sighted subsequently during the surveys in 1990-1994. As expected, during the initial years of the surveys many identified dolphins were added to the catalog. New fins were added to the catalog at a slower rate during subsequent years (Figure 5). The proportion of first-time identifications comprising the annual catalog each year declined from 99% in 1990 to 14% in 1994. These results are comparable to those from the Sarasota community (Wells and Scott 1990) and Tampa Bay (Wells *et al.* 1995), suggesting a relatively closed population for the Charlotte Harbor study area. Identifications added to the catalog over the years may represent changes to the fins of known animals, non-distinctive calves acquiring new markings (only a small number of calves are in our catalog), or animals that may have been missed in previous years. We found that overall there were few changes to fin markings throughout the surveys, and minor changes could be detected by a skilled observer familiar with the catalog. However, dramatic changes to fin markings could easily be undetected and could result in a previously identified animal being entered twice in the catalog.

The stability of fin markings over time enhances the probability of resighting individuals. The high frequency of resighting individuals and the long-term sighting histories suggeste ı high degree of residency for some animals in the Charlotte Harbor study area during the survey period (Figure 6). The consistency of the catalog and stability of fin markings over time contribute to our confidence in meeting the assumptions associated with generating abundance estimates from mark-resighting analyses.

Abundance Estimates and Trends

The catalog-size index (Method 1) resulted in minimum population estimates of 165 to 243 dolphins over the five years of the study, with an average of 203 (Table 3). The Method-1 estimates are known to be underestimates because they do not take into account the unmarked dolphins. Methods 2, 3, and 4 attempted to correct for this underestimation.

Method 2 (mark-proportion method) calculated population-size estimates from proportions of marked animals relative to revised minimum, revised maximum, and final best group size estimates. The differences between minimum and maximum population-size estimates were so small that we present only the estimates based on the final best group size. The number of dolphins estimated by Method 2 ranged from 226 to 422, with an average of 302 (Table 3).

Method 3 (mark-resight method) provided annual point estimates from the combined sightings made during two or three "complete surveys". The estimates ranged from 238 to 385 across all years, with an average of 313 (Table 3).

Method 4 (resighting-rate method) provided annual point estimates ranging from 194 to 385 dolphins, with an average of 267 (Table 3).

The abundance estimates were examined for trends across the five years of the surveys. Population-size estimates varied from one year to the next (Figure 7). The trends in abundance roughly followed variation in field effort, but the relationship did not appear to be strong. Comparison of 95% CL for Methods 2 and 3 (Figure 8) indicate a significant difference in the abundance estimates from the first three years compared to the last two years of the survey.

Power Analysis

The catalog-size index (Method 1) used a regression analysis of the five annual estimates to remove the effect of a potential trend and calculated a CV of 0.15 from the residuals (although no trend was apparent, a test with only five data points would be sensitive to outliers and would have low power). Given that alpha = 0.05, power = 0.80, r = 1.00 or -0.50, and CV = 0.15, we can then calculate the minimum number of surveys necessary to detect a trend. Three survey sessions would be required to detect a decreasing trend and four for an increasing trend.

A bootstrap variance procedure applied to Method 2 (mark-proportion method) yielded CVs ranging from 0.04 to 0.06, with an average CV of 0.05. This would allow an increasing or a decreasing trend to be detected in two surveys.

The CVs for the estimates for the mark-resight method (Method 3) ranged from 0.06 to 0.10, with an average CV of 0.08 for 1990-1994. This would allow an increasing or a decreasing trend to be detected in three surveys.

Method 4 (resighting-rate method) used the regression analysis described in Method 1 to yield a CV of 0.23. Three survey sessions would be required to detect a decreasing trend and four for an increasing trend.

Natality

The natality rate, the proportion of dolphins considered young-of-the-year, varied during the course of the surveys, ranging from 0.020 to 0.050 (Table 5). If these rates are applied to the population size estimates derived by Method 2 (mark-proportion method), then annual estimates of 7 to 17 young-of-the-year are derived for the Charlotte Harbor study area. The mark-proportion estimates are used here because the variances were low, and the estimates for population size and natality were calculated in a similar manner, i.e. on a proportion-of-school basis.

Mortality

There were 116 records of stranded animals from South Sarasota, Charlotte, and Lee counties from 1979-1994; 70 of these records were from 1990 to 1994 (Table 6, Figure 9). We were unable to calculate a mortality rate due to the bias associated with an increase in stranding response effort since the mid-1980s. Coastal development and boating activity on Charlotte Harbor waters have also increased dramatically, possibly contributing to the discovery of carcasses in previously isolated areas. However, there are still many remote and inaccessible areas within Charlotte Harbor where carcasses are unlikely to be found. All these factors confound determination of the actual number of strandings and make it impractical to calculate a mortality rate based on stranding records alone.

In an attempt to distinguish between mortalities and other kinds of losses from the population, photographs of stranded dolphins were examined. A total of 30 photographs were available to compare with the photo-ID catalog. Dorsal fins in photographs of 7 animals were deemed non-distinctive, i.e., they belonged to neonates, calves or otherwise had no diagnostic markings. Twenty-three animals were considered distinctive and were used to compare with the photo-ID catalog (Table 6). We identified 2 of the stranded animals: One animal was sighted in the first four years of the Charlotte Harbor surveys and stranded in March of 1994. The other was first identified in 1990 and died in November of 1991.

Of the 411 dolphins in the 1990-1994 Charlotte Harbor catalog, 165 were not seen during the last year of the study. Two of these (0.012) were confirmed as mortalities based on fin identifications.

Immigration, Emigration, Residency, and Transience

We were unable to develop a reasonable quantitative estimate of rates of immigration or emigration for Charlotte Harbor due to the brevity of the study period, as discussed under "Methods". All available data indicate that permanent immigration and emigration were rare occurrences. None of the more than 900 dolphins identified from Sarasota Bay (1975-1994) and Tampa Bay (1975-1993), the adjacent waters to the north, nor the 272 dolphins in photographs provided by Shane from her Pine Island Sound study area immediately to the south, were identified as immigrants to the Charlotte Harbor area during our study. Conversely, none of the 411 dolphins identified from Charlotte Harbor waters during 1990-1994 were observed to take up residence in Sarasota Bay or Tampa Bay.

Residency to portions of the Charlotte Harbor study area was suggested by repeated sightings of some individuals in the same waters over multiple years. Sixteen of the 411 dolphins in the catalog (3.8%) were also seen in the area prior to the initiation of the surveys in 1990. Twelve of these were first identified during 1982 - 1984. Twenty-seven dolphins (6.6%) were identified from the Charlotte Harbor study area during all five of the survey years; 97 (23.6%) were seen during at least four of the five survey years.

We did not find animals with regular movements through the entire study area when we examined those seen in multiple years, and those with the requisite 15 or more sightings needed for description of a home range (Wells 1978). Instead, we found clusters of sightings within localized areas, as has been described elsewhere along the central west coast of Florida (Wells 1986; Wells *et al.* 1995). For example, "CURL" was seen frequently in Lemon Bay during 1990 - 1994 (Figure 10 a). Sightings of dolphins such as "THUV" (1982 - 1991, Figure 10 b), "HISC" (1990 - 1994, Figure 10 c), and "TSMD" (1990 - 1994, Figure 10 d) were concentrated in Gasparilla Sound. Long-term sightings of dolphin "RPPR" (1982 - 1994, Figure 10 e) were spread through both Lemon Bay and Gasparilla Sound. Sightings of dolphin "LGSL" (1982 - 1994, Figure 10 f) were concentrated in and near the deep waters of Boca Grande Pass. "TFLN" (1982 - 1993, Figure 10 g) was seen repeatedly in the shallows in northern Pine Island Sound. Dolphins "CLTO" (1982 - 1992, Figure 10 h) and "ZIGY" (1990 - 1994, Figure 10 i) were seen primarily in the open, deeper waters of southern and western Charlotte Harbor proper. Dolphin "POTP" (1990 - 1994, Figure 10 j) was seen primarily in the shallow waters of eastern Charlotte Harbor. Little can be said about the year-round residency of these animals, except that all of the catalog members identified prior to the surveys were seen in months other than August. While these examples provide documentation of the tentative existence of long-term home ranges in the Charlotte Harbor area, they should not be interpreted as indicating that all of the dolphins in the area fall into these patterns. Additional sightings during different seasons would be required to accurately assign home ranges or other movement patterns to the dolphins in Charlotte Harbor.

Movements back and forth between Charlotte Harbor and waters to the north were recorded for ten (2.4%) dolphins of the 411 in the Charlotte Harbor catalog. A few individuals, such as "DIPT" (Figures 10 k,l) appear to spend equivalent amounts of time in southern Sarasota, Lemon Bay, and Gasparilla Sound, suggesting the existence of a home range connecting these two regions. Others, such as"RY34"

(Figures 10 m,n) and "BSLC" (Figures 10 o,p), emphasize one region, Sarasota or Charlotte Harbor, over the other, but on occasion move between regions. The most extreme movements were made by "SLIT" (Figures 10 q,r). This dolphin was observed in eastern Charlotte Harbor in August 1990, and in southern Tampa Bay in July 1991, a minimum swimming distance of about 125 km. It was not possible to describe a pattern for this animal based on only two sightings.

The longer-distance movements were similar to those demonstrated by Sarasota males making occasional excursions into Tampa Bay (Wells 1993; Wells *et al.* 1995). The gender is known for only three of the ten dolphins moving between regions. Two of the dolphins traveling the longest distance between regions are known males ("BSLC" and "RY34"), whereas one of the dolphins for which sightings are more evenly spread across a more limited extent of border waters is a female ("BRDO"). None of the other seven dolphins have been seen with a calf of their own, suggesting, but not conclusively demonstrating, that they may be males.

Limited movements between our Charlotte Harbor study area and waters to the south were indicated by matches with 12 of 272 photographs provided by Shane from her study area including southern Pine Island Sound and associated waters. These findings also supported the concept of local residency for dolphins in this region, since none of the dolphins matched between our Charlotte Harbor catalog and Shane's photographs were seen north of regions three and four of our study area. In addition, while another 12 Shane dolphins were identified in our records from nearby waters outside of our Charlotte Harbor study area, none of Shane's 272 dolphins were known from our Sarasota or Tampa Bay identification catalogs. Shane (1987) reported that several of her dolphins apparently inhabited home ranges in Pine Island Sound. Thus, at least some of the Charlotte Harbor and Pine Island Sound dolphins appear to follow the home range mosaic pattern seen elsewhere along the central west coast of Florida, in Sarasota and Tampa Bay (Wells 1986; Wells *et al.* 1995.).

Dolphins identified during only one year of the surveys were defined as transients. There were a minimum of six and a maximum of 34 dolphins per year that met our criteria for transience (Table 4) representing 4% to 14% of the annual catalog size. This should be considered a maximum estimate, since it may also include animals present during multiple years but not identified because of undetected changes to the dorsal fin, or because they were not photographed. None of the "transient" animals was seen in the Charlotte Harbor study area outside of the survey season, nor were they seen in adjacent study areas, so their origins and destinations remain undetermined.

Discussion

Photo-Identification Catalog

The ability to identify individuals over time using natural markings has proved to be a valuable and benign research tool and a standard in population studies of marine mammals. Maintaining a photographic database of individual dolphins enables researchers to monitor not only population parameters but habitat use, social association and distribution patterns.

The high proportion of marked dolphins and the high frequency of resightings underscores the importance of including only excellent quality images of distinctively marked individuals in the photo-ID catalog. This minimizes subjectivity in the matching process and reduces the chance of making incorrect identifications or missing them altogether.

The development and use of our photo-identification catalog has been tested in three study areas, including Charlotte Harbor, and has proven effective in each case. However, as the catalogs grow and we expand into different study areas, we recognize the utility of developing computer-assisted matching and archiving abilities.

Abundance Estimates and Trends

Comparison of the point abundance estimates from Methods 2, 3, and 4 indicates reasonable consistency across methods, and an indication of change from the first three years to the last two years of the study (Figure 7). In all cases the lower 95% CLs were greater than or equal to the minimum count provided by the catalog-size method. Thus, if we consider the most extreme 95% CL values to be the limits to our estimates, the number of dolphins using the Charlotte Harbor study area during the surveys was between 198 and 369 during 1990 - 1992, and between 315 and 463 during 1993 - 1994.

We attempted to identify the reasons for the apparent increase in abundance of dolphins in Charlotte Harbor during the later years of the survey. Contra-indicative results for Methods 2 and 3 in 1990 confound evaluation of the significance of differences between 1990 and later years (Figure 8). An apparent increase from 1992 to 1993 and 1994 was also evident, but field effort limitations brought about by Hurricane Andrew complicate interpretation of this year's estimate. Consistent patterns were obtained for both Methods 2 and 3 for comparisons between 1991, and 1993 and 1994, however. Based on Method 2, the abundance estimate from 1991 increased 31% and 61% in 1993 and 1994, respectively. For Method 3, the comparable increases were 40% and 45%. For perspective, this increase, within the summer season across years, is much smaller than the summer to winter increases of 176% and 223% reported by Thompson (1981) and Scott *et al.* (1989) for Charlotte Harbor and Pine Island Sound.

Though the increase does not represent an interannual doubling of the population, the change was significant, based on comparisons of 95% confidence limits (Figure 8). The increase was evident through all four abundance estimation methods, and it ran counter to the patterns of consistency across years demonstrated for Tampa Bay and Sarasota (Wells *et al.* 1995; Wells and Scott 1990). Our evaluation approach was to first examine corroborative indicators of the change, and then to test hypotheses about the possible biological or methodological source(s) of the increase.

The apparent increase in numbers of dolphins during 1993-1994 was corroborated by changes in the number of dolphins sighted per unit of sighting effort. For this analysis, we divided the sum of the final best point estimates of numbers of dolphins for each sighting for each year by the number of kilometers of survey transects for that year. This density indicator should be less prone to potential biases that might have resulted from violations of mark-recapture assumptions. The number of dolphins per km increased by 14% from 1991 through 1993 and 1994 (Table 7). This measure provided additional supportive evidence of an increase in the numbers of dolphins in Charlotte Harbor. We hypothesized three potential biological sources of dolphins to account for the increase: (1) through recruitment of young, (2) through an influx of new dolphins, and/or (3) from the return of previously identified individuals.

If the increase was due to recruitment of young, then several expectations follow. If we assume that Charlotte Harbor is a relatively closed population unit, and the entire increase resulted from reproduction, then the number of young-of-the-year during a given year should be greater than or equal to the change in abundance from the previous year. As can be seen from Table 5, production of young was nearly 2.5 times greater in 1993 than in 1990. At no time, however, does reproduction during one year entirely account for abundance increases in the next year.

If recruitment of young accounted for some, but not necessarily all, of the apparent abundance increase, then the proportion of marked animals (m/n for Method 2, Table 3) should decline over the years, since identifying marks tend to be acquired with age, and calves tend to be less marked than older animals. The accumulation of young-of-the-year from several years of increased reproductive output should be reflected in increased numbers of unmarked calves and juveniles in later years. The proportion m/n did in fact decline, from 0.80 in 1990, to 0.58 in 1994, suggesting a dilution of the pool of marked animals by young, as-yet unmarked individuals.

Any increase indicated from mark-recapture analyses that is due to recruitment of young, should be expected to be reflected by other indicators that are not based on marked animals. Increases in numbers of young-of-the-year should result in subsequent increases in calves. The number of young-of-the-year per kilometer of survey transect tripled from 1990 through 1991, 1992, and 1993 (Table 7).

The number of calves of all ages observed per kilometer of survey transect increased from 1990 values by 20% in 1991 and 1992, 40% in 1993, and 30% in 1994 (Table 7). Thus, it seems reasonable to conclude that at least a portion of the apparent increase in abundance of dolphins in Charlotte Harbor is the result of increases in reproduction during the course of our project.

If reproduction accounts for only a portion of the increase in abundance, then the balance must come from an influx of non-calves, either new to the area, or residents that had not been identified in the middle years of the study. As described above, non-calves would be expected to have acquired markings over time. Thus, an influx of new animals should be reflected in an increase in the annual catalog size in later years. Such an increase was apparent, but not dramatic (Figure 5). The number of new animals added to the catalog each year declined from 1990 - 1991 through 1993 - 1994, however, indicating that many, but not all, of the non-calves identified in later years were re-identifications of animals originally added to the catalog in earlier years. In addition, the average proportion of dolphins in the catalog in a given year that were identified in previous or subsequent years increased in 1993 - 1994 (Table 4).

This increase may be explained partially by fluctuations in the timing of seasonal increases in abundance. Aerial surveys by Thompson (1981) and Scott *et al.* (1989) have shown summer-to-winter increases of 176-223% in Charlotte Harbor and Pine Island Sound. If the main reason for the increased abundance was an influx of non-calves, then we would expect the proportion m/n to remain relatively constant over the five years. The fact that the proportion declined over the years suggests that more of the increase is due to reproduction than to an influx of older, better-marked animals (Table 3). The source of additional non-calves in Charlotte Harbor was not the contiguous coastal waters to the north, based on the results of censuses in Sarasota and Tampa Bays. It seems likely that any additional dolphins would have originated in the Gulf of Mexico or Pine Island Sound.

Thus we are left with a series of potential explanations for the apparent increase, none of which alone seems sufficient to explain the entire increase. In terms of relative contributions to the increase, it seems that recruitment of young had a greater potential effect than did reidentifications of earlier catalog members, and each of these accounted for more of the increase than did an influx of new non-calves.

We examined the possibility that the increase was at least in part a result of methodological complications, perhaps exaggerating a smaller real increase in numbers of dolphins. The low CVs, only slightly larger than those obtained by Wells *et al.* (1995) for our first application of these estimation techniques, during the Tampa Bay surveys, argued against methodological problems. We explored them, however, because of several differences in methods between the two studies.

The primary methodological differences involved level of effort. We had fewer boat-days each year for the Charlotte Harbor surveys than for the Tampa Bay surveys due to budgetary limitations. Though the Charlotte Harbor study area was 82% as large as the Tampa Bay study area, we had only 56% as many within-study-area boat-days each year compared to Tampa Bay. Fewer boat-days translated into fewer kilometers of survey transects, which meant less intensive photographic coverage of dolphins in the study area than was accomplished in Tampa Bay. This in turn might have affected the development of the identification catalog, resulting in an artificially low M in some cases. Differences in weather conditions from year to year resulted in varying geographical coverage within the study area, which may also have affected the size of M, and may have influenced m/n as well. Each of these factors is critical to the calculation of abundance estimates.

Each of the abundance estimation procedures assumed that M accurately represented the pool of marked dolphins in the study area during the survey period, and was independent of level of effort. The high proportion of marked dolphins (m/n), the relatively consistent values for M from year to year, and the numbers of resightings of marked individuals over the course of each survey suggested that we had obtained reasonable coverage and established a representative identification catalog in Tampa Bay (Wells *et al.* 1995). In Charlotte Harbor, however, m/n declined over time, the numbers of resightings per individual were smaller than Tampa Bay (Figure 6), and M fluctuated across years.

One way in which effort might influence M would be through uneven geographical distribution of surveys resulting in differential exposure to marked individuals. Given the existence of individual ranging patterns as proposed earlier in this report, decreased survey coverage of portions of the study area might mean fewer opportunities to photograph residents of those regions, resulting in a smaller and inaccurate M. Effort was not uniform across regions from year to year (Table 2). Adverse weather conditions made it difficult to reach the more distant regions, including Region 4 (Charlotte Harbor North) and Region 5 (northern Pine Island Sound, Figure 1), during some years. Our survey coverage of these two regions in 1994 was approximately double the coverage during the early years, and M was greater than in any previous year.

Region 5 was a potential source of complications regarding M both because coverage was variable from year to year, and also because it opened into greater Pine Island Sound to the south, a potential source of new dolphins or destination for previously identified dolphins, outside of our study area. We attempted to control for these complications by recalculating abundance estimates without including Region 5 sightings, or the marked dolphins sighted only in Region 5. This analysis showed that Region 5 had little effect on M or on the abundance trend.

We considered the possibility that uneven geographical coverage could result in a biased m/n. If this ratio varies from region to region, then differential coverage could result in a biased overall ratio, as applied in Method 2. We found that the ratio m/n was smaller in Regions 4 and 5 than in the other regions, and these regions were over-represented in the survey efforts of later years as compared to the other regions. This provided one potential explanation for the decline in the overall m/n in later years, and may have contributed to the apparent increase in abundance as evident from the results of Method 2. The "complete survey days" of Method 3 control for survey effort, however, and the general level of agreement between the results of Methods 2 and 3 suggest that a potentially biased m/n was not a major contributor to the increase in abundance.

The level of effort in Tampa Bay was greater and more consistent from year to year than in Charlotte Harbor. For example, due to Hurricane Andrew coverage of all regions in 1992 decreased to 51% - 65% of the kilometers surveyed in other years, with a concomitant decline in M to 68% to 93% of the levels from the other years. We examined the data for a direct relationship between survey effort and catalog size, by regressing M against number of boat-days and numbers of kilometers surveyed. No strong linear relationships were found, but M *vs.* boat-days approached statistical significance ($r^2 = 0.74$, $p = 0.06$), hinting at the role of effort in the development of an adequate catalog. Our findings suggest that an optimal level of effort exists between that expended in Tampa Bay and that in Charlotte Harbor. Empirical studies designed to identify the appropriate level of effort for mark-recapture surveys would be helpful.

Thus, methodological problems did not appear to be the primary factor in the increase in the abundance of dolphins in Charlotte Harbor. Though the reasons for the increase can not be fully explained with the information available, the increase appears to be real, and appeared to be contributed to by several factors. The low CVs associated with the abundance estimates provide additional confidence in the trends that are evident. It is recommended that future surveys attempt to eliminate some of the variables considered in the discussion above by striving for more intensive, uniform effort throughout the study area.

It is difficult to interpret comparisons of our abundance estimates to those reported from aerial surveys of Charlotte Harbor, because of methodological differences, and because of differences in the areas surveyed. The aerial surveys typically reported abundance estimates from Charlotte Harbor and Pine Island Sound combined, whereas our vessel surveys only included the northernmost portion of Pine Island Sound, due to logistical constraints. Our average abundance estimate from Method 2 (mark-proportion) for our limited survey area was comparable to the upper 95% CLs reported from the same season by Thompson (1981) and Scott *et al.* (1989) for their larger study area. As has been noted in other comparisons of vessel *vs.* aerial surveys (Scott *et al.* 1989; Wells *et al.* 1995), the aerial surveys appeared to have underestimated the numbers of dolphins in Charlotte Harbor.

The estimates we have derived reflect the numbers of dolphins found in the Charlotte Harbor study area at least once during a two- to three--week period in

August of each year. The estimates are based on a catalog that includes all of those dolphins for which satisfactory identification photographs were obtained during the survey period, without distinguishing between differences in the degree of use of the study area waters by different dolphins.

The catalog makes no distinction between those dolphins using the waters of the study area on a regular basis *vs.* those photographed during an infrequent passage through the study area. A number of overlapping home ranges occur along the central west coast of Florida, including Tampa Bay, Sarasota Bay, and Charlotte Harbor (Wells 1986), and home ranges apparently exist in Pine Island Sound (Shane 1987). The degree of overlap in home ranges in the Charlotte Harbor study area appears to vary. The probability of finding a given dolphin occupying a partially overlapping home range would be a function of the degree of overlap. The limits of our study area were not biologically based. They did not necessarily coincide with home range boundaries, for example, and therefore do not address the relative importance of waters and habitat features in the study area. Evaluation of the biological basis of population units has important management implications, but this requires more-detailed analysis of the community structure of dolphins in the Charlotte Harbor area.

Natality

Natality is likely underestimated because, if a diffuse calving season is assumed, then it is likely that some young calves were lost prior to each annual survey, and some may have been born after the survey. A spring through early fall peak in calving with occasional births occurring at anytime during the year has been reported for Sarasota Bay (Wells *et al.* 1987) and for the west coast of Florida in general (Urian *et al.*. in press). Thus, the actual crude birth rate may have been higher than the 0.020 to 0.050 reported from the 1990-1994 surveys.

The average Charlotte Harbor natality estimate of 0.034 for the period 1990-1994 is comparable to that reported for Tampa Bay for 1988-1993 (0.033 ± 0.0909, Wells *et al.* 1995), and slightly lower than that reported for Sarasota Bay (0.055 ± 0.0089 for Sarasota dolphins was calculated for the period 1980-1987 (Wells and Scott 1990). Observational effort in Sarasota has been ongoing, providing opportunities to observe a higher proportion of births. The narrow window for the Charlotte Harbor survey means that some calves are more likely to be missed. Thus, the Charlotte Harbor natality measure should be compared to a Sarasota measure between the crude birth rate and the recruitment rate (the proportion of calves surviving to age 1). For Sarasota Bay, the mean recruitment rate for 1980-1987 was 0.048 ± 0.0085 (Wells and Scott 1990). Therefore, a comparable measure of Sarasota natality might be between 0.048 and 0.055.

The variation in the natality rate over the five-year survey period also supports the conclusions drawn from the abundance estimates regarding the increase in population size.

Mortality

Measurements of dolphin mortality rates for Charlotte Harbor proved to be difficult to obtain during our survey period. In most cases we were unable to distinguish between mortalities, emigrations, undetected fin changes, and animals missed during the Charlotte Harbor surveys. In Sarasota, it has been possible to evaluate losses from the population from two directions, through the collection and examination of carcasses of identifiable individuals, and through records of disappearances of known individuals (Wells and Scott 1990). Mortality estimates are facilitated in Sarasota as compared to the Charlotte Harbor project because Sarasota involves a smaller number of dolphins with a higher proportion of them being identifiable, a smaller study area, a more-intensive, year-round monitoring effort, and more-complete and consistent stranding response effort.

The number of strandings reported during the Charlotte Harbor survey may, however, provide a relative index for comparison of mortality patterns. Dolphin strandings in Sarasota Bay, Tampa Bay and more generally along the central west coast of Florida followed the Charlotte Harbor pattern of dramatic increase from 1990 to 1991-1992, with a decline in 1993 (Wells *et al.* 1995). In Sarasota, strandings reached levels two to three times normal from late 1991 through 1992 resulting in a 10% decrease in the size of the Sarasota population (unpublished data). No such decline was observed in Charlotte Harbor, however. Severe red tides from blooms of the dinoflagellate *Gymnodinium breve* occurred along the central west coast of Florida during 1991, 1992, and 1994, the years of greatest numbers of strandings. Though no direct cause-effect relationships between red tide outbreaks and dolphin mortalities have yet been identified conclusively, the correlation noted here and elsewhere (Geraci 1989) suggests that further investigation may be warranted.

Uneven stranding response effort in Charlotte Harbor over the five years of the survey precluded quantitative trend analyses over the entire period of the project. The situation in Charlotte Harbor could improve in time. Stranding response teams are becoming more active in Charlotte Harbor, and communication between teams is improving. We know that good photographs of fresh carcasses can provide the basis for identifications (Urian and Wells 1993). These identifications are important not only for monitoring the population, but also because knowing the origin of a carcass can provide information that may aid in understanding cause of death or interpreting levels of environmental contaminants in tissues. Long-term and more frequent photographic monitoring of the dolphins in Charlotte Harbor would improve the basis for identifying and evaluating disappearances of catalog members.

Immigration/Emigration/Residency/Transience

Both immigration and emigration rates are difficult to interpret because of a number of potentially confounding factors. The survey effort was limited to a two- to three-week period, thereby minimizing the opportunity to identify dolphins in other times of the year and other areas. Changes to the fins may hinder our ability to identify individuals, resulting in the scoring of the changed fin as a new identification and the original identification as a loss. Unidentified or missed mortalities obscure actual emigration rates by counting them as losses instead of as known mortalities. It is also possible animals were in the study area but not sighted, or were photographed but not identified because of inadequate photographic quality or coverage (Slooten *et al.* 1992).

Overall, about 9% of the Charlotte Harbor population was estimated to be transient, whereas an average of 53% of the identifiable dolphins was known from multiple years. The low incidence of immigration, emigration and transience found for the dolphins in the Charlotte Harbor study area in the five-year period suggest a relatively closed population, at least during the August survey period. Resident dolphins have a greater chance of being resighted than do animals that are known to have extended home ranges. Several individuals have been resighted in the study area opportunistically during different seasons.

The apparent increase in abundance over the five years, and the dramatic seasonal increase reported from the aerial surveys suggested that Charlotte Harbor may not be as closed a unit as Sarasota or Tampa Bays. Seasonal increases from summer to winter of 176% and 223% reported by Thompson (1981) and for Charlotte Harbor and Pine Island Sound are much greater than the 25% seasonal increase reported for Tampa Bay (summer to autumn, Scott *et al.* 1989). Shane (1987) reported seasonal changes in patterns of occurrence in Pine Island Sound, but did not present estimates of change in abundance. No significant seasonal changes in abundance have been noted for Sarasota Bay, although seasonal changes in habitat use were evident (Wells 1993). Assuming that the seasonal variations in Charlotte Harbor reported from the aerial surveys reflect a true increase in abundance, then photographic identification surveys during the season of greatest abundance may shed light on the potential source of some of the increase in abundance reported from our August surveys.

<u>Summary of Population Parameters for Charlotte Harbor</u>

During August of each year from 1990 through 1994, an average of about 308 dolphins used the Charlotte Harbor study area (average of Methods 2 and 3). The abundance apparently increased from 198 - 369 (95% CLs, Methods 2 and 3) in 1990 - 1992 to 315 - 463 in 1993 - 1994. Part of this increase appeared to be due to an increase in reproduction. The average natality across the study years was 0.034, but a peak of 0.05 was reached in 1993. The increase in the proportion of calves from 0.12 in 1990 to 0.21 in 1993 and 1994 suggests the successful recruitment of many of the young-of-the year. It was not possible to calculate rates of immigration or emigration. Evidence from the high proportion of animals present in multiple years and the absence of documentation of unidirectional movements between Charlotte Harbor and other adjacent and distant contiguous study areas along the central west coast of Florida indicate that permanent immigration and emigration appear to be rare events. About 9% of the dolphins appeared to be transients. Immigration, emigration, and transience are not major influences on the number of animals present at any given time, but they may be important ecologically by providing a means of genetic exchange between populations, as demonstrated for the Sarasota dolphin community and for Tampa Bay (Duffield and Wells 1991, Wells and Scott 1990, Wells *et al.* 1995). It was not possible to calculate a meaningful mortality rate, but even though there was no indication from stranding data of catastrophic losses from the population during the survey period, the data mirrored patterns of mortality reported from other parts of the central west coast of Florida during the same period.

We attempted to summarize the components of the interannual differences in abundance estimates in Table 8. It appears that the increase in abundance from 1992 and 1993 may be attributed to a return to presumably normal mortality after high mortality the previous year, a higher-than-normal number of young-of-the-year recorded, a higher-than-normal number of calves recorded after a relatively low number recorded the previous year, and a higher-than-normal number of residents recorded in the area (due to increased movement into the area or more effective photographic effort). These data suggest that conditions in the area improved in 1993, particularly in comparison to 1992, with relatively high recruitment and possibly site fidelity, and improved survivorship.

Comparison of Abundance Estimation Methods

Methods 2, 3, and 4 produced similar estimates of population size (Table 3) even though the sampling units and calculations differed. All three of these methods have similar assumptions: a closed population, an equal probability of sighting all animals, random samples of dolphins resighted, and permanent and reliable marks on the dolphins.

To detect a trend in abundance, the method with the lowest bias, greatest precision, and easiest implementation in the field would be preferred. The accuracy of the estimates depends greatly on the adherence to the assumptions above. The problem of heterogeneity of sighting probabilities can cause a negative bias in the estimate of N (e.g., Hammond 1986), and has been shown to occur in mark-resight studies on bottlenose dolphins in Sarasota Bay (Wells and Scott 1990). To examine the effects of heterogeneity on the different methods, a greater understanding of the community structure of the area is necessary. Method 3, the mark-resight method, attempted to reduce the potential effect of heterogeneity by balancing the coverage of the regions within the study area, under the assumption that multiple communities of dolphins having restricted home ranges could be over- or under-sampled if coverage is not equal for all regions. Piecing together segments surveyed over a period of several weeks, however, could lead to biases if the assumption of population closure was violated. This assumption, based on the dolphin communities of Sarasota Bay, could be tested when the movements and ranges of Charlotte Harbor dolphins are better known.

The precision of the estimates is largely a result of the size and number of the samples and the proportion of marked dolphins in the population (M/N). Three of the above methods illustrate a range of compromises that can be made between the first two factors. The mark-proportion method (Method 2) sampled individual dolphin schools as units; this led to a large number of replicates, for which a bootstrap resampling method for estimating variance works well. Alternatively, the resighting-rate method (Method 4) used the entire survey season as a sampling unit, yielding large sample sizes per season (139-381 dolphins), but at the expense of replicate sampling. The mark-resight method (Method 3) used two or three "complete surveys" of the area as a sampling unit, and about 43-170 dolphins per field season, with sample sizes of about 2-88 dolphins per survey. The CVs calculated from Methods 2 and 3 were both acceptably low, although they cannot be compared directly because of the difference in variance-calculation methods (Method 2 = non-parametric bootstrap; Method 3 = binomial).

All of these methods may be prone to a negative bias due to heterogeneity of sighting probabilities, but this would be particularly true for Methods 2 and 4 if care was not taken to survey all areas at least some time during the field season. Estimates from Methods 2 and 4 averaged 4.9% and 20.1% lower than those of Method 3.

Power Analyses

The power analysis has proved to be a useful tool for survey design and management decisions. One can make *a priori* management decisions about the duration, sampling intensity, and statistical certainty of survey programs if one can estimate the CV of the methods being contemplated. Given the objectives to detect a halving or doubling in the population from one year to the next, it appears that Method 2 (mark-proportion method) can accomplish this goal for Charlotte Harbor dolphins with annual surveys. Method 3 (mark-resight method) would require up to three annual surveys, although it detected a significant increase of 56% between 1992 and 1993. The other methods require additional assumptions about the 1990-1994 abundance stability and are thus less useful. CVs can be obtained or improved, however, by sampling more often than the annual surveys chosen for this study, although care must be taken that additional variation due to seasonal differences in dolphin abundance, movements, and behavior is taken into account.

Survey Design

Selection of a survey technique for detecting trends in dolphin population-rate parameters should take into account the relative accuracy, precision, repeatability, and efficiency of the available methodology. Our findings from Charlotte Harbor and Tampa Bay indicate that coastal aerial surveys, while more efficient than photo-ID surveys at covering large areas, provide estimates that are less accurate and less precise.

The main reason for the close agreement among the estimates calculated from the different methods and the precision of the CVs was the high percentage of marked dolphins identified each year (58% to 80%). A large amount of survey effort is required to maintain such a high percentage. Ideally, the surveys should have two components: an intensive effort to photograph and identify dolphins (at the potential expense of not following a rigorous survey route or sampling design), and an effort to cover the whole area in a short period of time with repeatable survey routes. The first component allows the development of the photo-ID catalog so that sufficient numbers of marked dolphins are identified to estimate abundance precisely, while the second component would provide a standardized effort each year so that annual comparisons can be made.

Method 3 (mark-resight method) would provide satisfactory estimates from the second component of such a survey because the statistical properties of the more-traditional mark-recapture methods are well-known and the sampling units provided adequate sample sizes of marked animals. In Charlotte Harbor, as in Tampa Bay, however, it proved difficult to conduct "complete surveys" within the available survey window. Instead, we could only survey regions repeatedly while conditions were favorable when other regions were unworkable, and then shift our efforts opportunistically. If "complete surveys" can not be conducted, then Method 2 (mark-proportion) provides an acceptable alternative as long as the numbers of sightings and proportion of marked dolphins are high, and the effort among different regions is not greatly biased. This method is particularly useful because it can be more-readily calculated from the first component of the survey design during which the largest numbers of groups would be sighted. Methods 1 (catalog-size method) and 4 (resighting-rate method) may provide double-checks on the trends and estimates of the other two methods.

Recommendations

- Monitoring should be continued at least annually to track and evaluate the apparent trend. The more frequent the surveys, the better the chance of detecting a trend towards a catastrophic decline. More-intensive surveys would permit more-refined determinations of natality, immigration, emigration, transience, and mortality. Although two or three annual surveys can detect large trends in abundance, this study illustrates the difficulty of interpreting the causes for the abundance changes without more detailed or longer-term information.
- Photo-ID work should be expanded to other seasons to examine previous reports of seasonal fluctuations in abundance.
- Empirical studies designed to identify the appropriate level of effort for mark-recapture surveys should be conducted.
- Photo-ID efforts should be expanded to greater distances offshore and along the coast to examine immigration, emigration, and transience in greater detail.
- Patterns of habitat use in Charlotte Harbor should be examined through integration of GIS habitat data with our sighting data. Efforts should be made to integrate ecological studies of the dolphins of Charlotte Harbor with other research efforts under the National Estuary Program.
- Community structure needs to be examined in more detail to define biologically meaningful management units. Existing information on residency, ranging and social patterns, and genetics should be integrated to arrive at population

designations. Analysis of community structure is necessary to interpret immigration, emigration, and transience relative to population size. Sample sizes for examination of mt-DNA haplotype distributions in Charlotte Harbor should be augmented through biopsy darting or capture-release efforts. The genetics data should be supplemented with telemetry data on movements and additional photo-ID efforts.

- The accessibility of stranding data was highly variable from one responding group to the next in Charlotte Harbor. Improved coordination of efforts and availability of information would be helpful. Mote Marine Laboratory, Tom Pitchford, and Bob Wasno provided excellent examples of cooperation and assistance.
- The correlation between increases in the number of dolphin strandings and the occurrence of red tide blooms suggests that further investigation into the role of red tide in dolphin mortality is warranted.

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Appendices

Table 1. Summary of bottlenose dolphin abundance estimates from aerial surveys of Charlotte Harbor and Pine Island Sound: 1975-1994.

Year	Season	Abundance Estimate	95% CL Low	95% CL Up	Source
1975-76	All	64	10	118	Odell and Reynolds (1980)
1980	Summer	189	3	375	Thompson (1981)
	Autumn	157	0	611	
	Winter	434	159	709	
	Spring	191	51	331	
1983-86	Summer	206	135	277	Scott *et al.* (1989)
	Autumn	117	77	157	
	Winter	378	244	512	
1994	Autumn	209			Blaylock *et al.* (1995)

Table 2 Survey effort, 1990-1994.

	1990	1991	1992	1993	1994	Total
Survey Dates:						
Begin	10-Aug	10-Aug	10-Aug	17-Aug	1-Aug	
End	28-Aug	28-Aug	28-Aug	27-Aug	12-Aug	
Number of Boat Days:						
All Regions	29	30	18	26	31	134
Charlotte Harbor Regions	28	22	16	24	28	118
Number of Kilometers Surveyed in Regions 1-5:						
Region 1	272	228	170	206	213	
Region 2	619	470	283	265	362	
Region 3	427	335	209	394	320	
Region 4	330	268	152	366	594	
Region 5	51	54	46	100	120	
Total	1,699	1,355	860	1,331	1,609	6,854
Number of Sightings:						
All Regions	184	124	130	199	253	890
Charlotte Harbor Regions 1-5	162	115	104	172	223	776
Number of Dolphins Observed (best point estimate):						
Total Dolphins						
All Regions	1,043	757	640	867	1,060	4,367
Charlotte Harbor Regions 1-5	898	696	512	771	939	3,816
Calves						
All Regions	189	169	137	201	218	
Charlotte Harbor Regions 1-5	156	156	101	185	207	
Young-of-the-Year						
All Regions	32	48	36	38	34	188
Charlotte Harbor Regions 1-5	20	43	24	36	34	157
Number of Photographs: All Regions	7,164	4,500	3,574	4,850	5,902	25,990

Table 3. Annual Charlotte Harbor dolphin population size estimates.

	1990	1991	1992	1993	1994	Average
Method 1 (Catalog-size)						
No. of dolphins in catalog (M)	209	178	165	218	243	203
Method 2 (Mark-proportion)						
No. of Grade 1 sightings (s)	62	38	45	96	121	
Mean proportion of marked dolphins/group (m/n)	0.80	0.68	0.73	0.64	0.58	
Population size estimate (N)	**260**	**262**	**226**	**342**	**422**	**302**
Standard deviation (SD)	13.9	21.3	13.2	18.0	22.3	
Coefficient of variation (CV)	0.05	0.08	0.06	0.05	0.05	0.06
Upper 95% CL	287	304	252	376	463	
Lower 95% CL	240	232	207	315	389	
Method 3 (Mark-resight)						
Number of "complete surveys"	3	3	2	3	3	
Average population size estimate (N)	**307**	**265**	**238**	**372**	**385**	**313**
Standard deviation (SD)	31.1	22.4	19.9	24.0	21.9	
Coefficient of variation (CV)	0.10	0.08	0.08	0.06	0.06	0.08
Upper 95% CL	369	309	278	420	429	
Lower 95% CL	245	221	198	324	341	
Method 4 (Resighting-rate)						
No. of dolphins sighted per season (n)	158	156	139	302	381	
No. of marked dolphins sighted per season (m)	123	106	93	182	233	
Population size estimate (N)	**230**	**208**	**194**	**318**	**385**	**267**

Table 4. Number (%) of dolphins in the catalog of a given year (bold) that were identified in previous or subsequent years. Dolphins identified in only a single survey year were considered "transients".

YEAR	1990	1991	1992	1993	1994
1990	**209**	106 (51%)	94 (45%)	108 (52%)	112 (54%)
1991	106 (60%)	**178**	82 (46%)	94 (53%)	105 (59%)
1992	94 (57%)	82 (50%)	**165**	102 (62%)	106 (64%)
1993	108 (50%)	94 (43%)	102 (47%)	**218**	148 (68%)
1994	112 (46%)	105 (43%)	106 (44%)	148 (61%)	**243**
Average:	53%	47%	46%	57%	61%
"Transients"	25 (12%)	18 (10%)	6 (4%)	15 (7%)	34 (14%)

Table 5. Young-of-the-year and calf proportions of the mark-proportion annual population estimates.

	1990	1991	1992	1993	1994	Average
Mean Young-of-the-Year Proportion	0.030	0.040	0.030	0.050	0.020	0.034
Standard Deviation (SD)	0.1100	0.1000	0.1000	0.1300	0.0868	
Calculated No. of Young-of-the-Year in Population	**7**	**11**	**7**	**17**	**8**	**10**
Upper 95& CL (+ 2 SD)	9	13	8	21	9	
Lower 95& CL (- 2 SD)	5	9	6	13	7	
Mean Calf Proportion	0.120	0.170	0.140	0.210	0.210	0.170
Standard Deviation (SD)	0.1900	0.1985	0.1985	0.2200	0.2154	
Calculated No. of Calves in Population	**33**	**44**	**32**	**72**	**87**	**54**
Upper 95& CL (+ 2 SD)	46	61	45	104	124	
Lower 95& CL (- 2 SD)	20	27	19	40	50	
Number of Grade 1 Sightings Used for Mean	62	38	45	96	121	
Mark-Proportion Population Size Estimate (N)	260	262	226	342	422	

Table 6. Summary of known mortalities based on examination and photographs of stranded dolphins in the three counties encompassing the Charlotte Harbor study area

	All Counties		S. Sarasota County				Charlotte County				Lee County			
Year	Total No. of Stranded dolphins	No. of Stranded Dolphins from Catalog	No. of Strandings	No. Photos Available	No. of Distinctive Fins	No. ID from Catalog	No. of Strandings	No. Photos Available	No. of Distinctive Fins	No. ID from Catalog	No. of Strandings	No. Photos Available	No. of Distinctive Fins	No. ID from Catalog
1990	8	0	1	1	0	0	3	2	1	0	4	2	2	0
1991	20	1	3	1	1	0	13	6	5	1	4	2	1	0
1992	17	0	2	2	1	0	10	3	1	0	5	2	2	0
1993	8	0	0	0	0	0	2	1	1	0	6	2	2	0
1994	17	1	1	1	1	1	7	2	2	0	9	3	3	0
Total	70	2	7	5	3	1	35	14	10	1	28	11	10	0

Table 7. Proportion of dolphins sighted per kilometer surveyed.

YEAR	Dolphins/km	Calves/km	Young-of-the-year/km
1990	0.53	0.10	0.01
1991	0.51	0.12	0.03
1992	0.60	0.12	0.03
1993	0.58	0.14	0.03
1994	0.58	0.13	0.02

Table 8. Components of the inter-annual differences in abundance estimates. N_1 is the Method-3 abundance estimate for Year 1 (Table 3). Mortality is estimated conservatively by the sum of the stranded dolphins reported between surveys (September - August) in S. Sarasota and Charlotte Counties. Reproduction includes two components. The first is the number of YOYs added to the population in Year 2. The second is the number of older calves, which can serve as an index of calf survivorship and/or attractiveness of the area for raising calves. The change in the number of calves is calculated by subtracting the number of calves in Year 1 and the number of YOYs in Year 1 (who would be calves in Year 2 if all survived) from the number of calves in Year 2 (Table 5). (This approximation also assumes that the number of calves that become independent of their mothers each year remains constant.) Transients present in Year 1 but not in Year 2 are subtracted; those present in Year 2 are added (Table 4). Fluctuations in the number of residents due to movements into or out of the area or due to inability to photograph these dolphins even when present can be estimated by first calculating the difference between Year 1 and Year 2 in the number of marked residents in the catalog (R = M - No. of Transients) and then adding the estimated number of unmarked residents (R * (1 - m/n), Tables 3,4). The Sum of all of these columns can then be compared with N_2, the Method-3 abundance estimate calculated for Year 2 (Table 3). The unaccounted-for difference between the Sum and N_2 is likely due to imprecision and bias of the abundance estimates or the components listed in the table.

		Mortality	Reproduction		Transients				
Yr 1- Yr 2	N_1	(Year 2)	YOYs	Calves	Yr 1	Yr 2	Residents	Sum	N_2
1990-1991	307	- 6	+ 11	+ 4	- 25	+ 18	- 32	277	265
1991-1992	265	- 18	+ 7	- 23	- 18	+ 6	- 2	217	238
1992-1993	238	- 6	+ 17	+ 33	- 6	+ 15	+ 60	351	372
1993-1994	372	- 4	+ 8	- 2	- 15	+ 34	+ 9	402	385

Figure 1. Charlotte Harbor study area, depicting survey Regions 1 - 5.

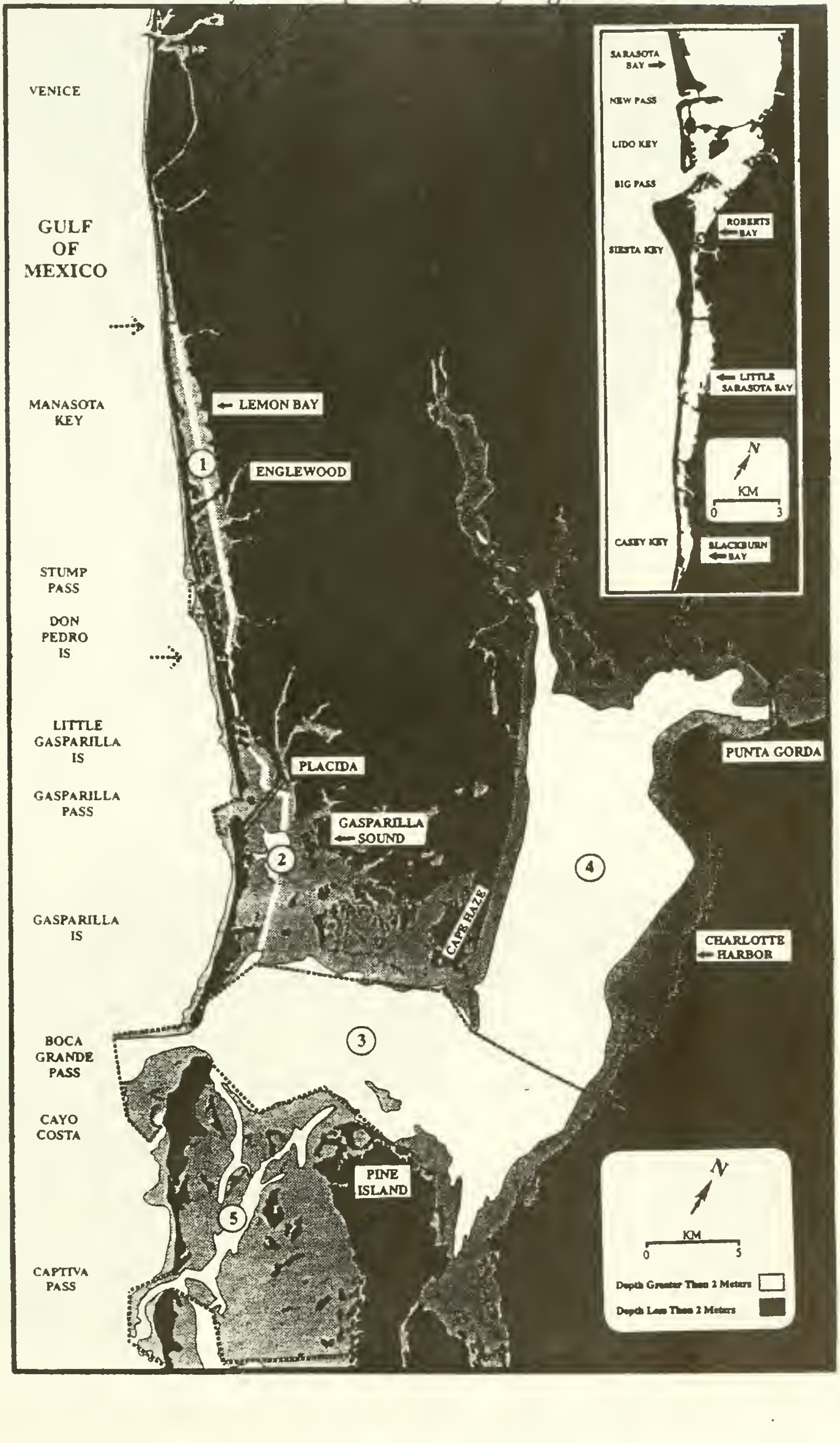

Figure 2a. Locations of sightings during 1990-1994: Groups of 1-5 dolphins.

Figure 2b. Locations of sightings during 1990-1994: Groups of 6-10 dolphins.

Figure 2c. Locations of sightings during 1990-1994: Groups of 11-15 dolphins.

Figure 2d. Locations of sightings during 1990-1994: Groups of 16-20 dolphins.

Figure 2e. Locations of sightings during 1990-1994: Groups of >20 dolphins.

Figure 3. Survey effort and sighting results

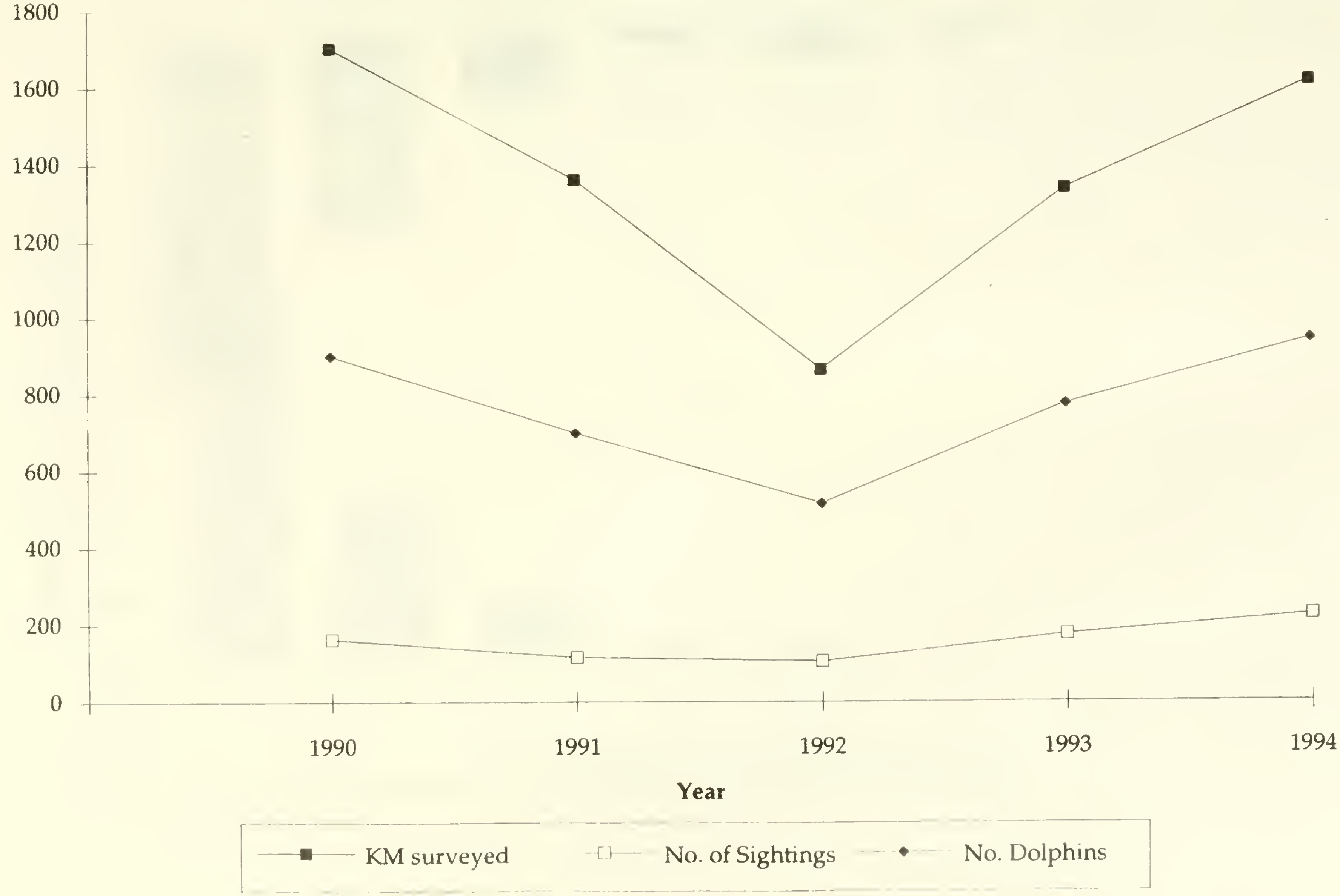

Figure 4a. Frequency distribution of number of sightings per individual dolphin in 1990.

Figure 4b. Frequency distribution of number of sightings per individual dolphin in 1991.

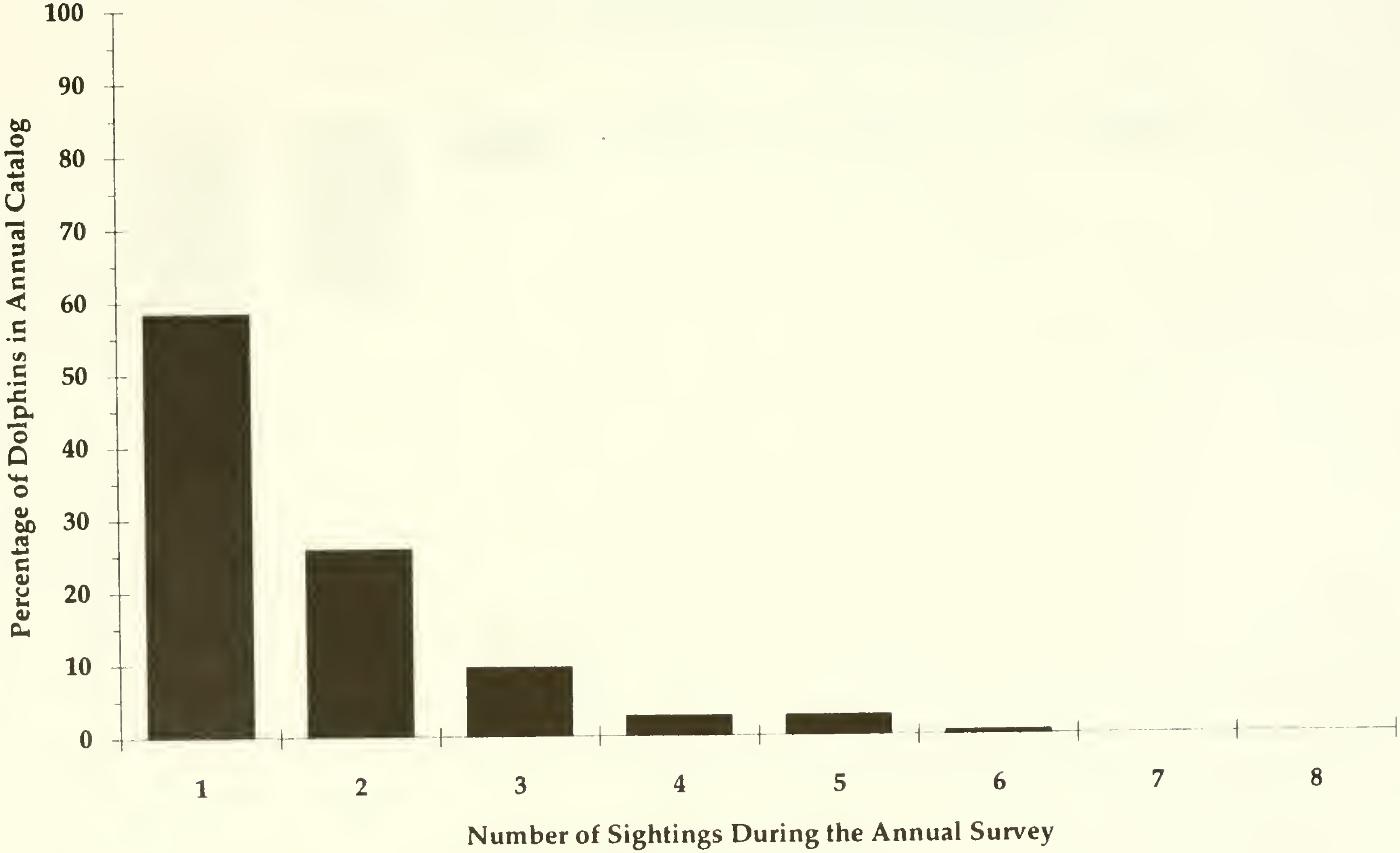

Figure 4c. Frequency distribution of number of sightings per individual dolphin in 1992.

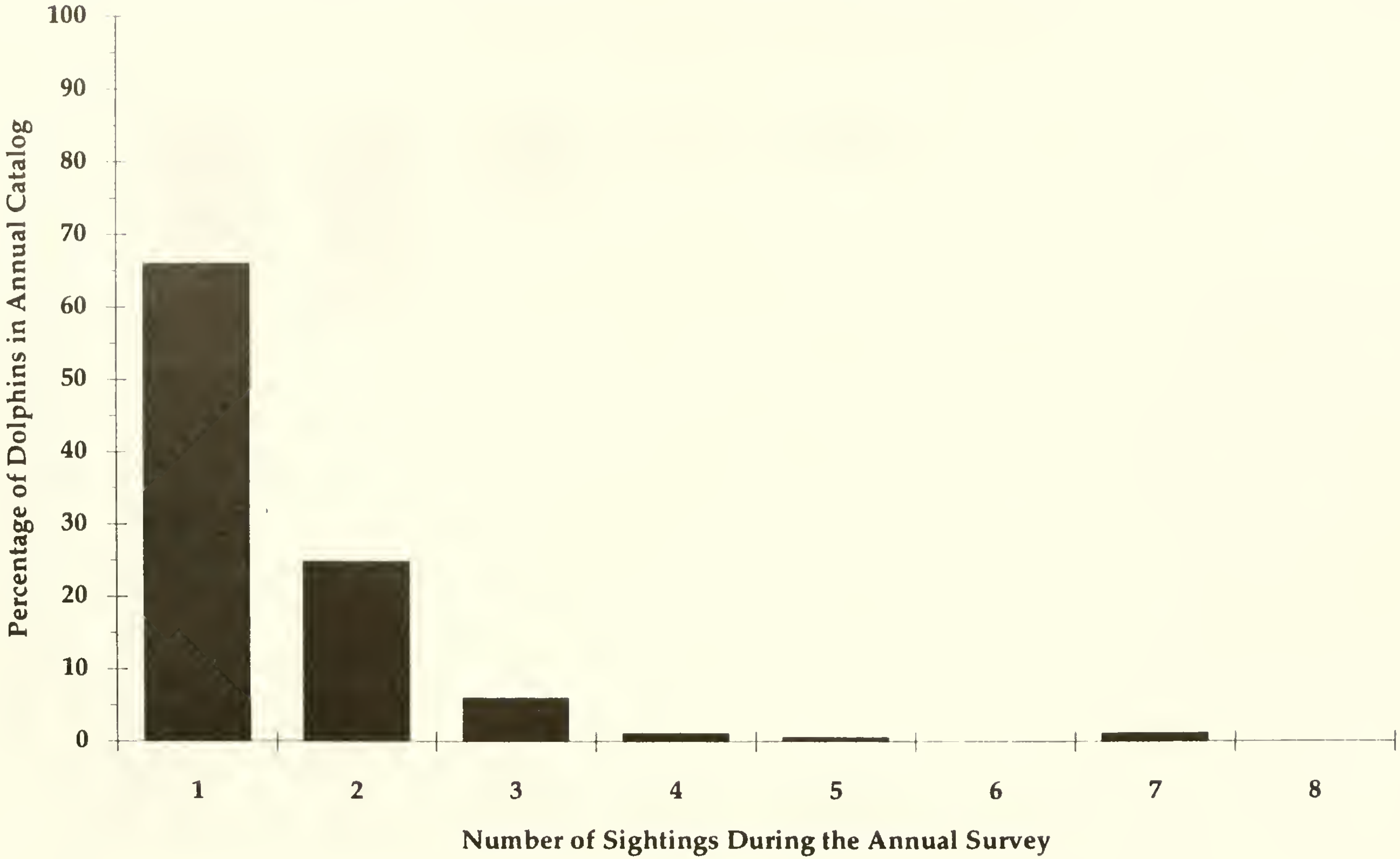

Figure 4d. Frequency distribution of number of sightings per individual dolphin in 1993.

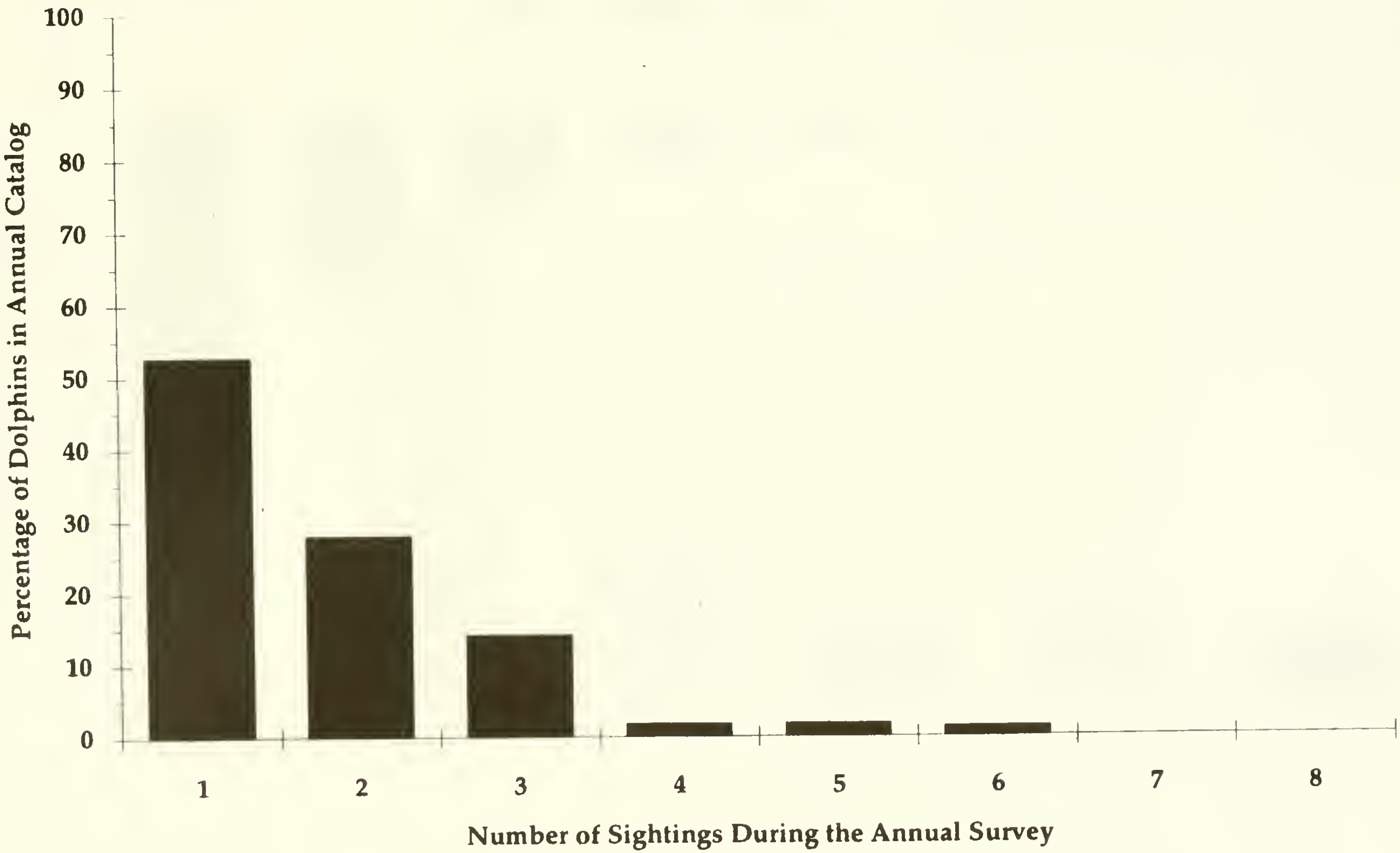

Figure 4e. Frequency distribution of number of sightings per individual dolphin in 1994.

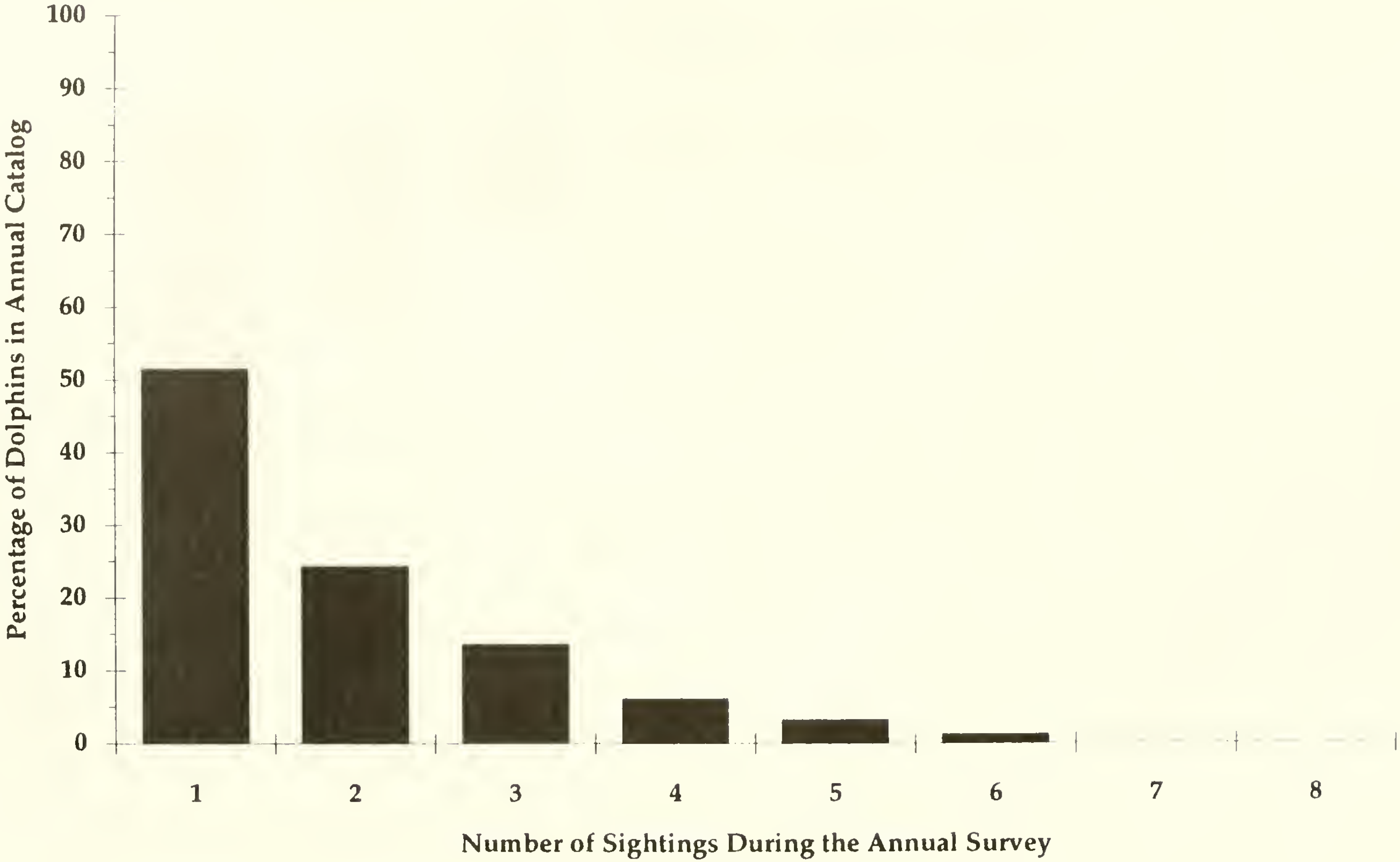

Figure 5. Annual catalog size and numbers of additions to the catalog.

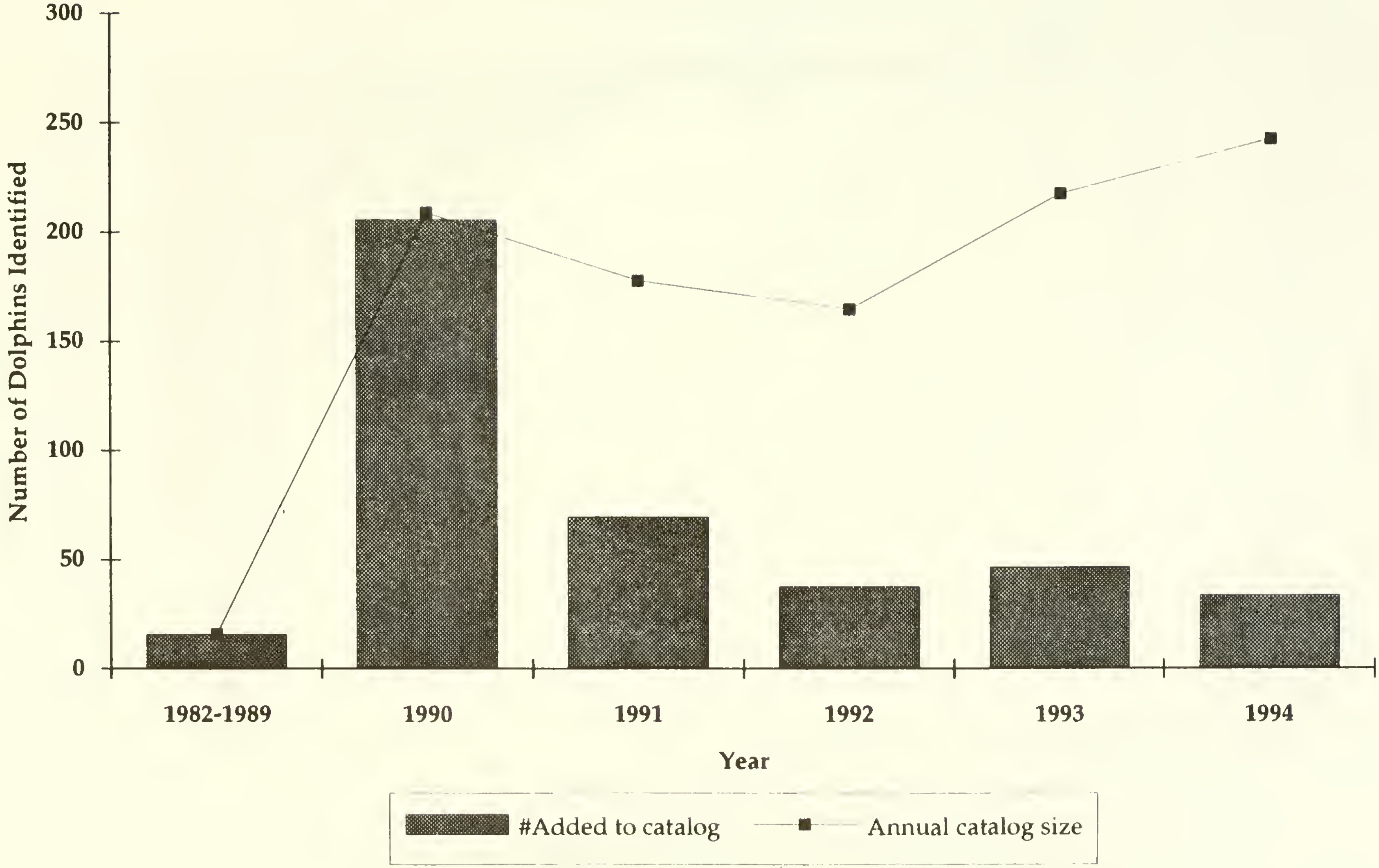

Figure 6. Sighting frequencies for identifiable dolphins, summarized over all five survey years.

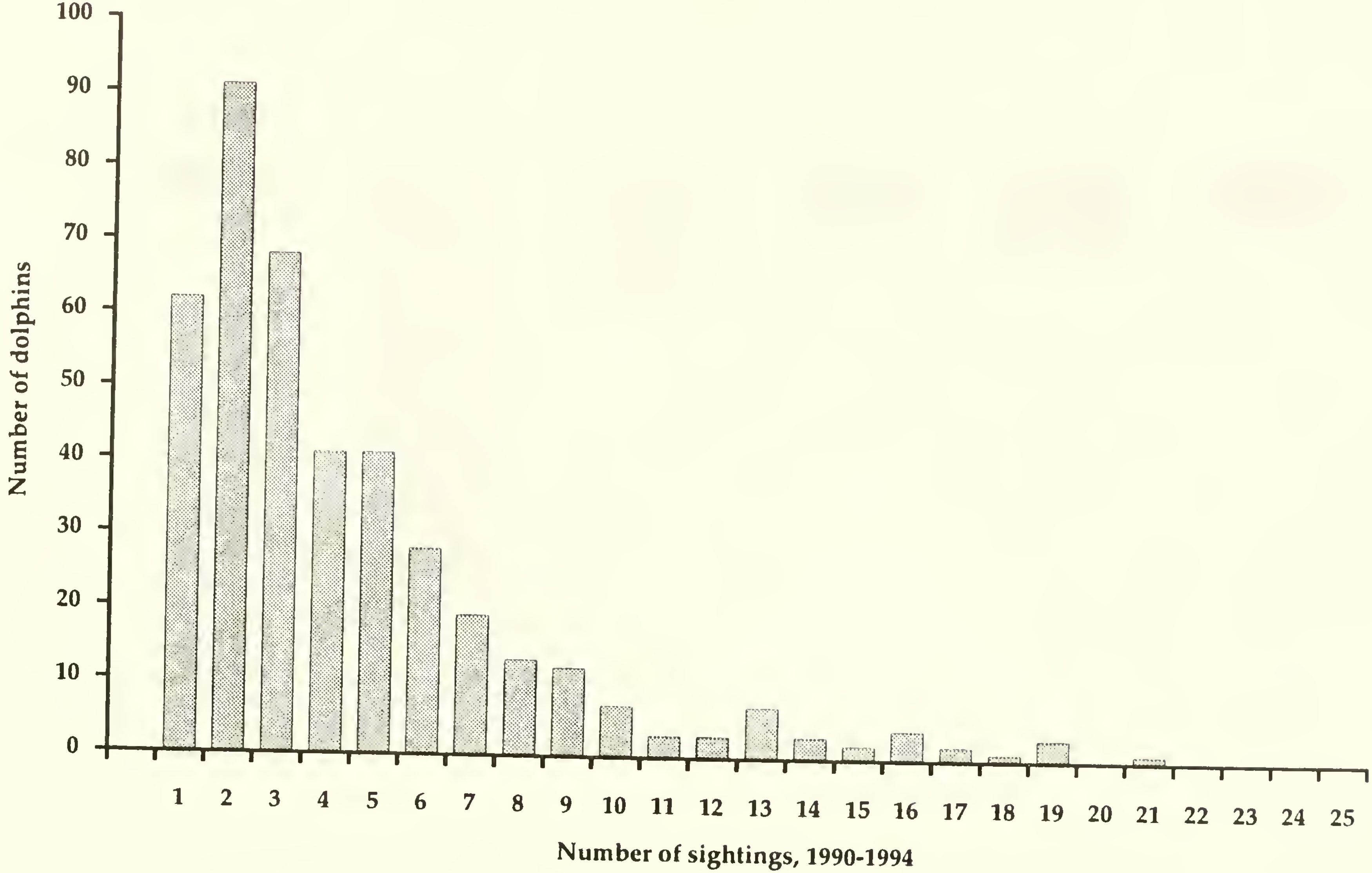

Figure 7. Population size estimates relative to survey effort.

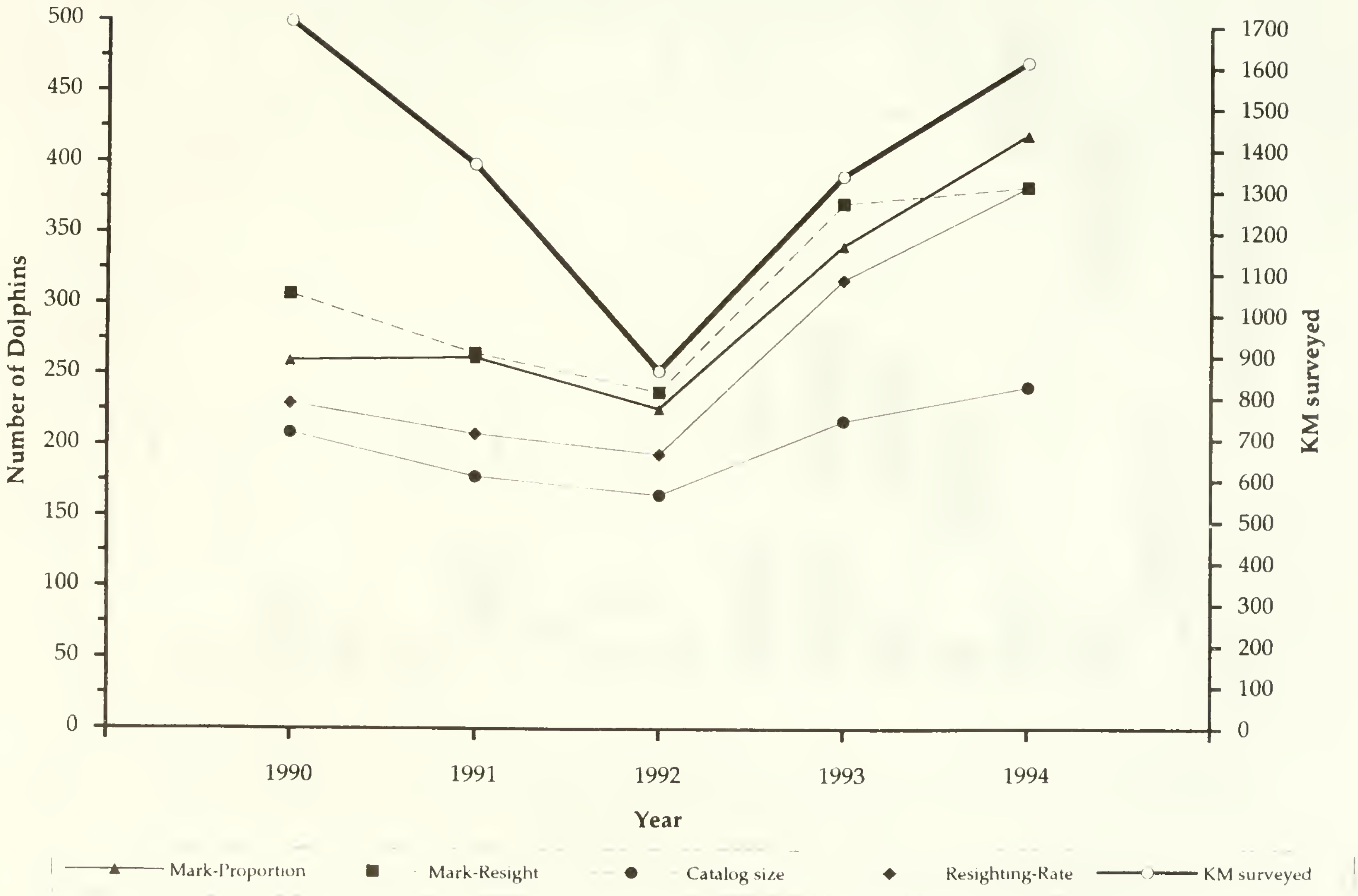

Figure 8. Comparison of Method 2 (mark-proportion) and Method 3 (mark-resight) abundance estimates with 95% CL.

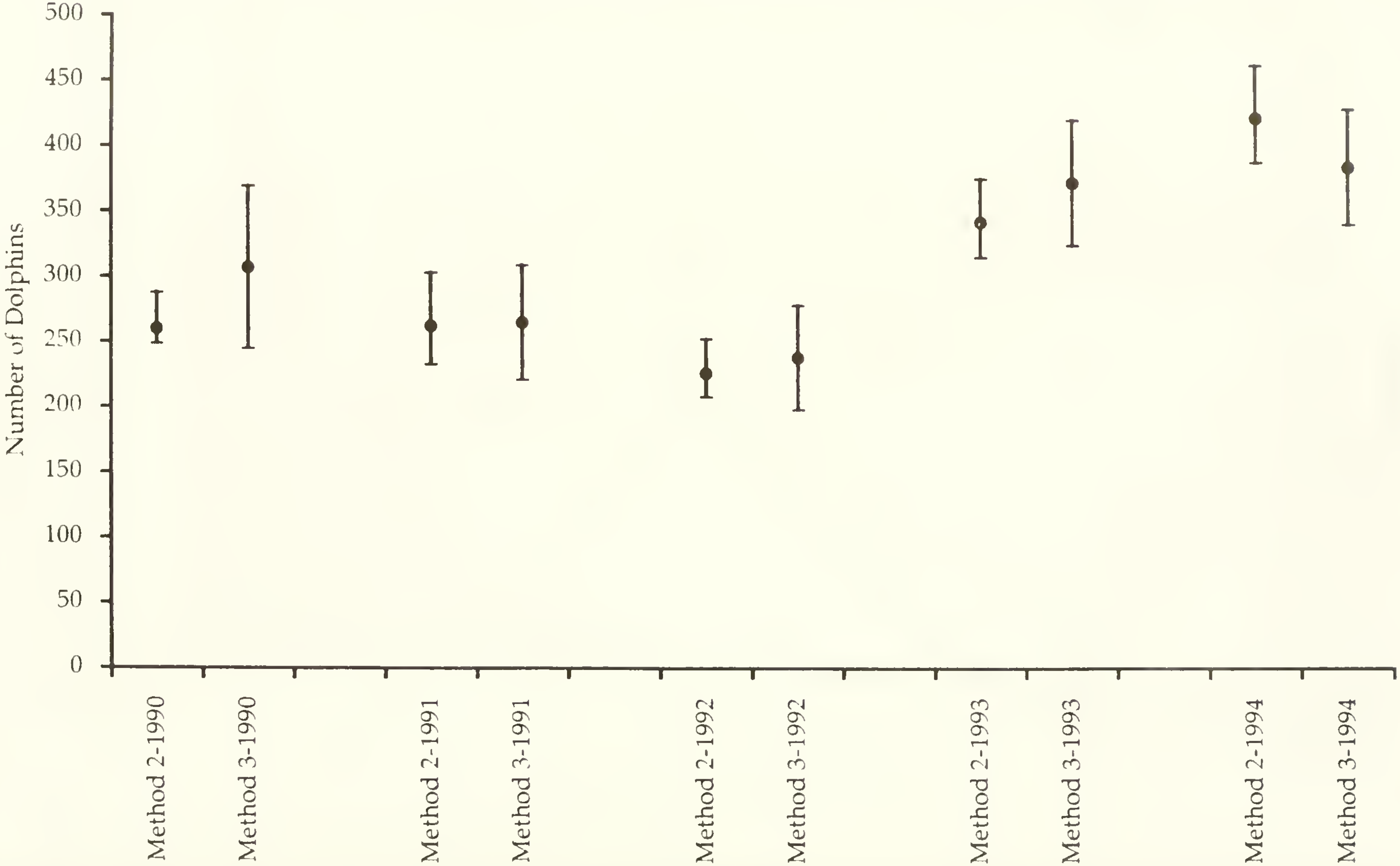

Figure 9. Number of reported strandings, by county.

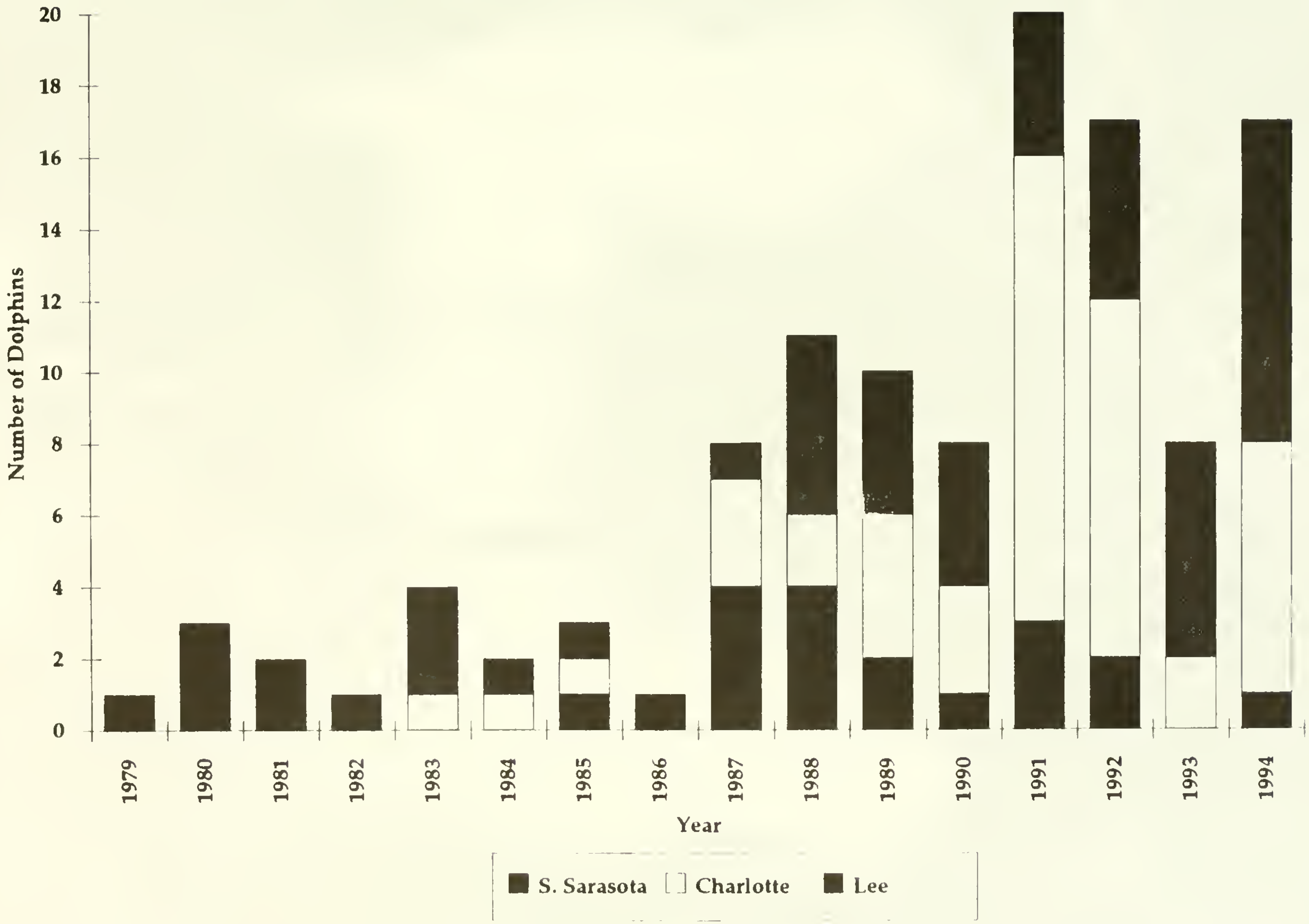

Figure 10(a). Sightings of 'CURL': 1990-1994

Figure10(b). Sightings of 'THUV': 1982-1991

Figure10(c). Sightings of 'HISC': 1990-1994

Figure10(d). Sightings of 'TSMD': 1990-1994

Figure10(e). Sightings of 'RPPR': 1982-1994

Figure10(f). Sightings of 'LGSL': 1982-1994

Figure10(g). Sightings of 'TFLN': 1982-1993

Figure10(h). Sightings of 'CLTO': 1982-1992

Figure10(i). Sightings of 'ZIGY': 1990-1994

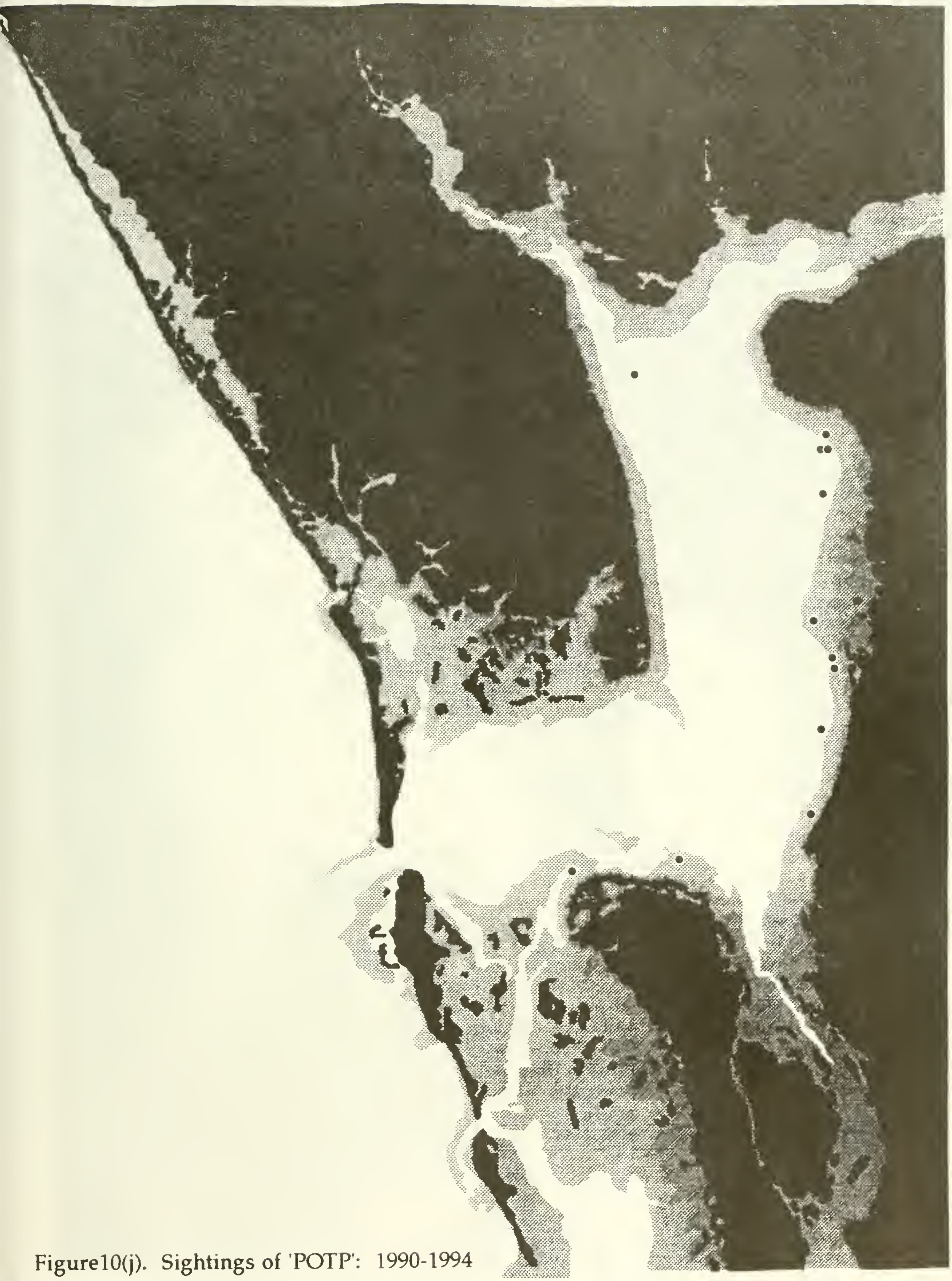

Figure10(j). Sightings of 'POTP': 1990-1994

Figure10(k). Sightings of 'DIPT': 1983-1994

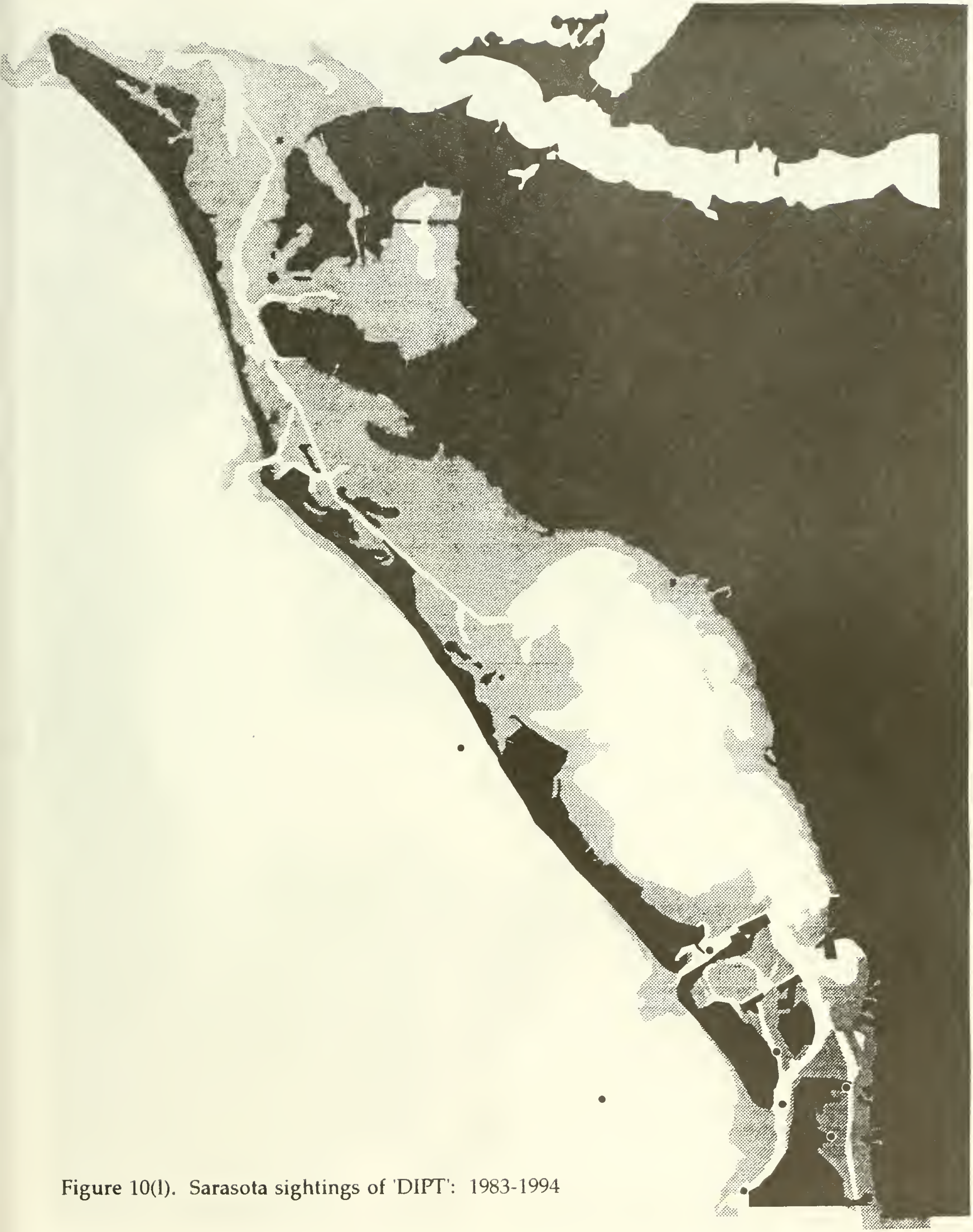

Figure 10(l). Sarasota sightings of 'DIPT': 1983-1994

Figure10(m). Sightings of 'RY34': 1984-1994

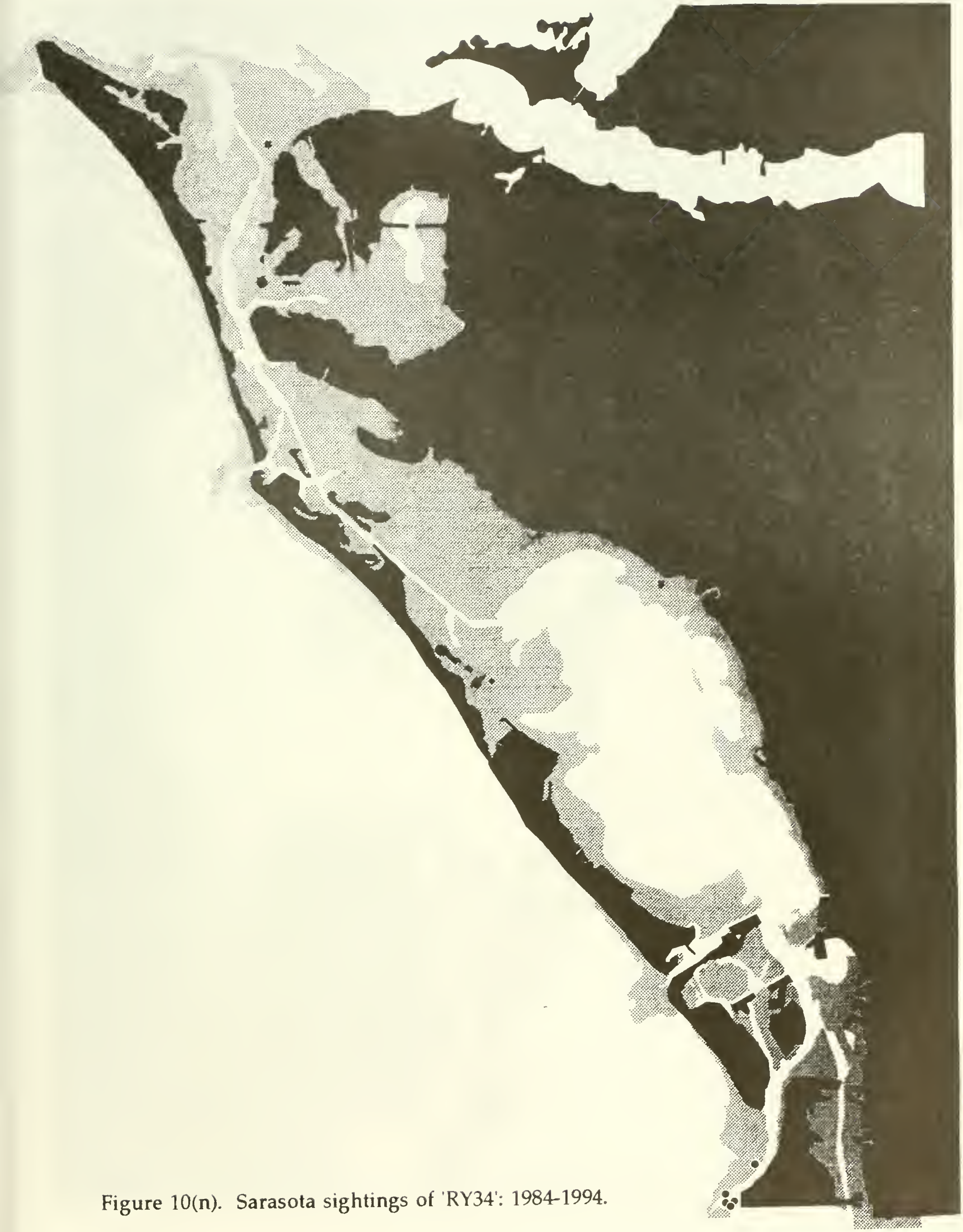

Figure 10(n). Sarasota sightings of 'RY34': 1984-1994.

Figure10(o). Sightings of 'BSLC': 1982-1994

Figure 10(p). Sarasota sightings of 'BSLC': 1982-1994.

Figure10(q). Sighting of 'SLIT': 16 August 1990

Figure 10(r). Tampa Bay sighting of 'SLIT':
19 July 1991

Dolphin Biology Research Institute
Sighting Sheets

Field Hours ______ to ______

Date __/__/__

Effort [S O C]

Sighting No: [ ]

Platform ________ [ ]

Observers ________________________________ Time [ ] to [ ]

Location ________________________________ LOC [ ]

Latitude [ ] [ ] [ ] Longitude [ ] [ ] [ ] Swim Speed [ ]

Conditions ________________________________ COND [ ]

Depth [ ] ft. Water Temp: [ ] °F Tide: IN OUT 1 2 HI 3 LOW 4 Heading: [ ] Initial [ ] General

Activity: Mill 1, Feed 2, Prob. Feed 3, Travel 4, Play 5, Rest 6, Leap Tailslap Chuff 7, Social 8, w/Boat 9, Other 0 [ ]

FIELD ESTIMATES	MIN	MAX	BEST	PHOTO ANALYSIS: Pos IDs	Min not IDed	Max not IDed	Revised MIN	Revised MAX	Final BEST
TOTAL DOLPHINS									
TOTAL CALVES									
YOUNG OF YEAR									

Comments: ________________________________

Associated Organisms: ________________________________

Dolphins Sighted: ID confirmation: P= photograph V= visual O = other (explain)

Name	Code	Conf.	Name	Code	Conf.	Name	Code	Conf

Photos: (roll: frame->frame) ________________________________

Tape: (tape counter) ________________________________

Appendix 1 Environmental condition codes.							
CONDITION CODES:							
SEA STATE		**WEATHER**		**GLARE**		**SIGHTABILITY**	
Wave Height 0-0.2m (8 in)	0	Clear or few clouds	0	None	0	Excellent	0
Wave Height 0.2-0.4m (8-16 in)	1	Partly cloudy	1	Little, non-interfering	1	Good, unlikely to miss dolphins	1
Wave Height 0.4-0.6m (16-24 in)	2	Overcast	2	Some, could interfere	2	Fair, may miss some dolphins	2
Wave Height 0.6-0.8m (24-32 in)	3	Rain	3	Much, interfering	3	Poor, probably missing dolphins	3
Wave Height 0.8-1.0m (32-40 in)	4	Thunderstorm	4			Not on effort	4
Wave Height > 1.0 m (>40 in)	5	Fog	5				
INITIAL OR GENERAL HEADING:							
Use degrees in most cases, "360"=North							
Milling="000"							
In passes, rivers, use "IN" or "OUT" if degrees are less appropriate							

Appendix 2
Definitions of Relevant Parameters from the Sighting Data Forms

Field Hours: The time the boat left the dock and time it returned. Time "off effort" is recorded when no systematic effort is being made to search for dolphins.

Date: The date is entered as DAY/MONTH/YEAR

Sighting No.: This is entered serially for each day.

Photographic Coverage: The box to the right of "Platform" is for an indication of the quality of the photographic coverage of the group and is filled in during photo analysis. 1 = Excellent: all dolphins in the group were photographed or otherwise positively identified; 2 = Good: there are photographs of dolphins with distinctive fins that might be in the catalog, but because of the photo quality it is not possible to make appropriate comparisons with the catalog (e.g., it is possible the out-of-focus fins may already be in the catalog, but can't be certain); 3 = Poor: photo coverage is known to be incomplete, because not all dolphins were approached for photographs, no photos were taken, film did not turn out, etc.

Time: Time the dolphins were first sighted and the time they were left or last seen.

Location: A description of the location of the initial sighting.

LOC: A 3-letter code based on physiographical features.

Latitude and Longitude: These coordinates are calculated from a chart or from a LORAN and entered as degrees, minutes, and 1/100ths of a minute.

Conditions and COND: This refers to meteorological and sea state conditions. They are described briefly, and entered as a code in the box. The condition codes are given on the attached page. A running log of environmental conditions relative to survey effort (noted at each major change in conditions or significant location) are kept in a separate logbook.

Field Estimates: These nine values are entered in real time in the field. The number of **TOTAL DOLPHINS** includes all age classes in the sighting. The **MIN**imum estimated number present, the **MAX**imum estimated number present, and the **BEST**estimate (between min and max) are entered. The **BEST** estimate is a point estimate, count, or midpoint of a range of estimates. The number of **TOTAL CALVES** includes all calves in the sighting, including young-of-the-year. The number of **YOUNG OF YEAR** are all of the calves born within the year. Typically, these are recognizable as newborns during the first six months of life.

Photo Analysis: These values are entered after completion of photographic analyses, and the **Dolphins Sighted** section at the bottom of the page. **Pos IDs** is the number of animals positively identified from photographs or in real time. **Min not IDed** is the **MIN** minus **Pos IDs**, or the minimum number of dolphins that were not identified. **Max not IDed** is the **MAX** minus the **Pos IDs**, or the maximum number of dolphins not identified. **Revised MIN** is the sum of the number of **Pos IDs** plus the **Min not IDed**. In most cases it will be the same as the **MIN**, except when the number of **Pos IDs** exceeds the **MIN**. Similarly, the **Revised MAX** will be the sum of the **Pos IDs** plus the **Max not IDed**. It will equal the **MAX** except in those cases where the **Pos IDs** exceed the **MAX**. The **Final BEST** estimate is the best point estimate, literal count, or midpoint of the

Revised MIN and **Revised MAX** estimates. It will be about the same as the **BEST** field estimate except in those cases where **Pos IDs** exceed **MIN**, **MAX**, or **BEST**.

Dolphins Sighted: Dolphins positively identified in real time in the field are listed by their **Name** and a "V" is entered under **Conf.** as a visual confirmation. Most identifications are made in the lab, when the name and four place identification **Code** are entered for each dolphin along with the Photographic Confirmations.

Photos: The photographer, roll and frame numbers.

DATE	SIGHT#	PHOTO GRADE	TIME BEGIN	TIME END	LAT DEG	LAT MIN	LAT SEC	LONG DEG	LONG MIN	LONG SEC	TOT POSID	TOT BEST	CALF POSID	CALF BEST	YOY POSID	YOY BEST
19900810	53	1	1716	1736	26	56	25	82	21	25	2	2	0	0	0	0
19900810	54	1	1751	1757	26	54	0	82	19	50	1	1	0	0	0	0
19900812	52	1	1034	1100	26	52	50	82	19	0	1	1	0	0	0	0
19900812	53	1	1150	1204	26	49	30	82	16	42	0	1	0	0	0	0
19900812	54	1	1228	1307	26	46	12	82	15	6	7	8	0	2	0	0
19900812	51A	1	1026	1032	26	52	42	82	19	5	2	2	0	0	0	0
19900812	51B	1	1107	1114	26	51	15	82	18	10	2	2	0	0	0	0
19900813	4	1	1320	1355	27	0	55	82	24	50	3	3	0	0	0	0
19900813	5	1	1402	1411	26	58	20	82	22	80	1	1	0	0	0	0
19900813	51	1	1000	1048	26	50	0	82	16	48	2	2	0	0	0	0
19900813	52	1	1028	1048	26	49	24	82	16	0	3	3	0	0	0	0
19900813	53	1	1110	1150	26	48	10	82	15	40	2	2	0	0	0	0
19900814	1	1	1551	1600	26	53	5	82	19	20	1	1	0	0	0	0
19900814	2	1	1657	1743	26	56	55	82	21	40	4	5	1	1	0	0
19900814	3	1	1757	1829	26	54	40	82	20	15	2	2	0	0	0	0
19900814	4	1	1824	1829	26	55	18	82	20	38	1	1	0	0	0	0
19900814	5	1	1838	1903	26	54	10	82	19	40	3	3	0	0	0	0
19900814	6	1	1903	1914	26	54	36	82	20	0	1	2	0	1	0	1
19900814	7	2	1914	1931	26	54	50	82	20	10	0	1	0	0	0	0
19900814	8	2	1936	1946	26	54	28	82	19	55	1	2	0	0	0	0
19900814	51	1	1623	1659	26	44	36	82	14	42	3	4	0	1	0	0
19900814	52	2	1703	1820	26	44	0	82	15	6	6	18	0	6	0	0
19900814	53	1	1834	1843	26	45	24	82	14	12	0	1	0	0	0	0
19900815	1	2	850	901	26	50	30	82	17	12	0	1	0	0	0	0
19900815	2	1	914	936	26	48	48	82	15	54	6	7	0	1	0	1
19900815	3	2	1033	1045	26	46	50	82	12	24	2	5	0	1	0	0
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19900815	6	1	1206	1219	26	51	35	82	18	25	2	2	0	0	0	0
19900815	53	1	1227	1247	26	54	79	82	20	25	1	1	0	0	0	0
19900815	54	1	1351	1430	26	55	7	82	20	28	2	2	1	1	0	0
19900816	1	1	849	907	26	52	6	82	18	36	1	1	0	0	0	0
19900816	2	2	943	1010	26	48	48	82	15	36	1	2	0	0	0	0
19900816	5	2	1309	1457	26	44	48	82	5	24	22	30	0	2	0	0
19900816	6	2	1541	1602	26	45	24	82	13	24	5	7	0	1	0	0
19900816	51	2	843	940	26	51	13	82	18	14	4	5	2	2	0	0
19900816	53	1	1052	1100	26	44	12	82	10	35	1	1	0	0	0	0

DATE	SIGHT#	PHOTO GRADE	TIME BEGIN	TIME END	LAT DEG	LAT MIN	LAT SEC	LONG DEG	LONG MIN	LONG SEC	TOT POSID	TOT BEST	CALF POSID	CALF BEST	YOY POSID	YOY BEST
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19900816	56	2	1248	1321	26	49	36	82	8	0	6	8	0	1	0	0
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19900816	4A	2	1153	1231	26	44	36	82	8	42	6	10	0	3	0	0
19900816	57A	2	1426	1453	26	52	48	82	9	12	7	8	0	0	0	0
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19900817	2	1	951	1043	26	46	12	82	15	0	5	6	0	1	0	0
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19900817	4	1	1117	1200	26	44	42	82	12	18	5	10	0	3	0	0
19900817	5	2	1211	1255	26	43	48	82	8	8	9	10	0	0	0	0
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19900817	7	2	1408	1435	26	46	6	82	9	48	3	7	0	3	0	0
19900817	58	2	1614	1620	26	46	18	82	14	54	5	7	0	0	0	0
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19900818	4	1	1150	1212	26	40	30	82	13	20	2	3	0	0	0	0
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19900822	1	1	916	934	26	52	52	82	19	0	2	2	1	1	1	1
19900822	6	2	1227	1232	26	49	0	82	18	6	2	5	0	0	0	0
19900822	7	1	1305	1324	26	50	40	82	17	30	2	2	0	0	0	0
19900822	8	1	1400	1420	26	55	70	82	20	20	1	1	0	0	0	0
19900822	51	1	954	1014	26	51	54	82	17	12	2	2	1	1	1	1
19900822	52	2	1048	1125	26	44	24	82	14	6	6	8	0	0	0	0
19900822	55	1	1341	1351	26	49	42	82	4	12	0	2	0	0	0	0
19900822	56	2	1401	1425	26	52	18	82	4	42	3	12	0	1	0	0
19900822	9A	1	1445	1502	26	57	20	82	22	9	2	3	0	1	0	0
19900822	9B	1	1552	1552	26	56	15	82	21	25	2	3	0	1	0	0
19900823	4	2	1200	1307	26	40	18	82	5	12	2	6	0	2	0	0
19900823	5	2	1317	1337	26	42	18	82	6	36	2	7	0	2	0	0

DATE	SIGHT#	PHOTO GRADE	TIME BEGIN	TIME END	LAT DEG	LAT MIN	LAT SEC	LONG DEG	LONG MIN	LONG SEC	TOT POSID	TOT BEST	CALF POSID	CALF BEST	YOY POSID	YOY BEST
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19900823	7	2	1512	1555	26	45	30	82	14	18	12	23	0	6	0	2
19900823	51	1	916	937	26	50	0	82	17	6	2	2	1	1	0	0
19900823	52	1	944	954	26	49	18	82	13	30	0	1	0	0	0	0
19900823	53	1	1012	1044	26	46	0	82	14	12	4	4	0	0	0	0
19900823	54	2	1106	1152	26	45	12	82	9	54	5	12	0	3	0	1
19900823	55	2	1350	1411	26	52	30	82	9	24	2	6	0	0	0	0
19900823	56	2	1427	1458	26	47	42	82	7	30	15	18	0	3	0	0
19900824	1	2	937	1024	26	47	33	82	15	36	6	7	0	0	0	0
19900824	2	1	1044	1052	26	46	6	82	14	55	0	2	0	1	0	0
19900824	3	1	1044	1102	26	45	58	82	14	20	1	1	0	0	0	0
19900824	51	1	921	1009	26	50	0	82	17	0	4	5	2	2	0	0
19900824	54	2	1126	1204	26	45	48	82	14	18	15	16	0	5	0	2
19900826	1	2	934	1031	26	48	12	82	15	24	8	17	0	5	0	0
19900826	2	2	1046	1148	26	44	54	82	14	54	13	24	0	6	0	1
19900826	3	1	1205	1219	26	45	6	82	9	48	2	2	0	0	0	0
19900826	6	1	1440	1449	26	52	6	82	9	18	0	2	0	1	0	0
19900826	7	1	1450	1454	26	51	36	82	9	0	1	3	0	1	0	0
19900826	53	1	1115	1139	26	41	18	82	13	32	1	4	0	0	0	0
19900826	54	2	1202	1311	26	40	10	82	12	18	4	8	0	0	0	0
19900826	55	2	1322	1412	26	41	1	82	11	45	9	15	0	3	0	0
19900826	56	2	1500	1528	26	44	27	82	11	27	7	10	0	0	0	0
19900826	5A	2	1253	1329	26	47	6	82	7	18	8	15	0	0	0	0
19900826	5B	2	1506	1519	26	52	30	82	8	18	8	15	0	0	0	0
19900827	1	1	904	934	26	54	22	82	20	0	3	3	0	0	0	0
19900827	7	1	1125	1147	26	49	30	82	16	20	0	4	0	1	0	0
19900827	8	1	1302	1310	26	56	30	82	21	66	2	2	0	0	0	0
19900827	52	2	1115	1135	26	42	30	82	5	58	0	3	0	1	0	0
19900827	53	2	1145	1212	26	44	0	82	8	30	6	10	0	2	0	0
19900827	55	2	1239	1307	26	45	19	82	14	23	10	15	0	4	0	0
19900828	51	1	1209	1230	26	57	20	82	22	10	2	2	0	0	0	0

DATE	SIGHT#	PHOTO GRADE	TIME BEGIN	TIME END	LAT DEG	LAT MIN	LAT SEC	LONG DEG	LONG MIN	LONG SEC	TOT POSID	TOT BEST	CALF POSID	CALF BEST	YOY POSID	YOY BEST
19910810	2	1	1638	1713	26	53	60	82	19	72	8	8	0	0	0	0
19910811	2	1	1425	1433	26	44	61	82	9	83	1	1	0	0	0	0
19910811	3	2	1457	1518	26	43	57	82	13	46	1	2	0	0	0	0
19910811	53	1	1424	1455	26	44	54	82	15	5	4	5	0	2	0	0
19910812	51	1	906	914	26	50	20	82	17	4	2	2	1	1	0	0
19910812	52	2	930	948	26	46	69	82	14	78	0	4	0	2	0	1
19910812	54	2	1100	1111	26	44	52	82	11	15	5	6	0	0	0	0
19910812	56	1	1144	1158	26	44	44	82	9	12	2	2	0	0	0	0
19910812	58	1	1251	9999	26	41	62	82	6	87	0	5	0	2	0	0
19910812	59	1	1334	1342	26	42	67	82	8	13	4	4	0	0	0	0
19910812	151	2	934	958	26	45	54	82	12	49	0	2	0	1	0	1
19910812	152	2	1007	1029	26	45	63	82	11	67	3	5	0	1	0	0
19910812	153	2	1047	1150	26	45	30	82	9	17	5	14	0	5	0	3
19910812	155	1	1308	1329	26	49	20	82	4	35	0	4	0	2	0	0
19910812	158	2	1520	1545	26	48	97	82	8	45	3	8	0	2	0	0
19910814	1	1	912	935	26	50	27	82	17	30	0	2	0	1	0	0
19910814	2	1	935	950	26	50	27	82	17	30	2	2	0	0	0	0
19910814	3	1	1000	1021	26	49	58	82	16	62	2	4	1	2	0	0
19910814	4	2	1045	1114	26	45	68	82	14	82	8	16	0	7	0	4
19910814	5	1	1350	1500	26	53	91	82	20	41	8	12	0	3	0	2
19910814	51	2	1036	1115	26	46	55	82	4	18	5	10	0	3	0	0
19910814	52	1	1402	1418	26	56	59	82	21	86	5	5	0	0	0	0
19910814	53	1	1434	1451	26	57	8	82	22	24	3	3	0	0	0	0
19910815	52	2	1046	1134	26	44	12	82	5	61	4	9	0	2	0	0
19910815	54	1	1256	1316	26	49	67	82	4	52	3	4	0	0	0	0
19910815	151	1	912	933	26	49	43	82	16	60	2	2	0	0	0	0
19910815	152	2	942	1054	26	48	99	82	15	63	7	10	0	3	0	2
19910815	153	2	1106	1139	26	46	82	82	14	93	4	9	0	3	0	3
19910815	155	1	1224	1240	26	46	29	82	14	60	1	2	0	0	0	0
19910815	156	1	1321	1334	26	41	28	82	13	83	4	4	0	0	0	0
19910815	159	1	1426	1440	26	40	29	82	13	3	2	3	0	1	0	0
19910815	160	2	1453	1511	26	41	63	82	11	43	5	7	0	2	0	0
19910815	161	2	1516	1542	26	42	43	82	10	89	5	10	0	0	0	0
19910815	162	1	1555	1602	26	45	12	82	13	86	1	1	0	0	0	0
19910817	51	1	1036	1120	26	49	97	82	16	64	2	3	1	1	0	0
19910818	1	1	917	936	26	45	47	82	12	55	2	2	0	0	0	0

DATE	SIGHT#	PHOTO GRADE	TIME BEGIN	TIME END	LAT DEG	LAT MIN	LAT SEC	LONG DEG	LONG MIN	LONG SEC	TOT POSID	TOT BEST	CALF POSID	CALF BEST	YOY POSID	YOY BEST
19910818	3	2	1016	1025	26	45	75	82	7	26	2	5	0	2	0	0
19910818	4	1	1032	1041	26	46	27	82	5	50	1	2	0	0	0	0
19910818	5	1	1050	1120	26	46	30	82	4	21	2	3	0	1	0	1
19910818	6	1	1113	1134	26	47	7	82	4	37	1	2	0	0	0	0
19910818	7	2	1156	1236	26	53	17	82	5	79	2	6	0	1	0	0
19910818	9	1	1404	1420	26	47	0	82	8	49	7	8	0	1	0	0
19910818	52	2	1013	1056	26	46	68	82	8	27	2	8	0	2	0	0
19910818	53	2	1057	1200	26	47	62	82	7	8	11	16	0	3	0	0
19910818	54	1	1257	1308	26	50	65	82	8	91	0	2	0	1	0	0
19910819	1	1	856	905	26	51	12	82	18	28	1	1	0	0	0	0
19910819	3	1	1037	1145	26	44	68	82	14	85	6	8	0	0	0	0
19910819	7	2	1458	1600	26	41	99	82	6	88	9	20	0	4	0	2
19910819	51	2	1013	1047	26	49	74	82	5	36	1	2	0	0	0	0
19910820	2	1	942	959	26	49	26	82	16	39	2	2	0	0	0	0
19910821	1	1	1038	1049	26	45	73	82	14	64	2	3	0	0	0	0
19910821	3	2	1236	1330	26	41	63	82	11	44	6	14	0	3	0	1
19910821	4	1	1355	1438	26	40	24	82	13	46	6	14	0	5	0	2
19910821	5	1	1534	1540	26	43	39	82	14	41	0	3	0	0	0	0
19910821	6	1	1608	1612	26	49	26	82	15	87	0	3	0	1	0	0
19910821	51	2	1133	1208	26	47	50	82	14	40	0	3	0	1	0	0
19910821	52	2	1220	1230	26	47	50	82	14	2	0	1	0	0	0	0
19910824	51	2	1347	1426	26	58	6	82	22	84	7	8	0	0	0	0
19910824	52	1	1500	1600	26	58	6	82	22	84	10	10	0	1	0	1
19910825	1	1	925	951	26	47	12	82	15	26	2	4	0	1	0	1
19910826	4	2	1221	1244	26	36	51	82	13	37	2	8	0	2	0	1
19910826	5	2	1247	1255	26	36	73	82	12	70	0	2	0	0	0	0
19910826	6	2	1309	1405	26	40	44	82	13	31	7	11	0	3	0	0
19910826	7	1	1515	1527	26	48	86	82	16	38	2	3	0	1	0	1
19910826	54	1	1536	1607	26	45	83	82	14	73	6	8	1	3	0	2
19910827	1	2	1606	1707	26	53	43	82	20	50	11	22	0	8	0	2

DATE	SIGHT#	PHOTO GRADE	TIME BEGIN	TIME END	LAT DEG	LAT MIN	LAT SEC	LONG DEG	LONG MIN	LONG SEC	TOT POSID	TOT BEST	CALF POSID	CALF BEST	YOY POSID	YOY BEST
19920811	1	1	1040	1051	26	50	8	82	16	32	0	2	0	1	0	0
19920811	2	1	1108	1221	26	47	40	82	16	45	5	7	0	2	0	0
19920811	3	1	1353	1404	26	49	40	82	16	5	1	1	0	0	0	0
19920811	55	1	1443	9999	26	57	94	82	22	85	2	2	0	0	0	0
19920813	1	1	855	914	26	51	28	82	18	16	1	1	0	0	0	0
19920813	2	2	950	1017	26	48	6	82	14	5	0	3	0	0	0	0
19920813	5	1	1225	1231	26	38	80	82	13	5	1	2	0	0	0	0
19920813	6	1	1320	1355	26	46	57	82	14	45	7	8	0	2	0	0
19920813	8	1	1455	1500	26	49	10	82	16	11	1	2	0	1	0	0
19920813	9	1	1527	1530	26	51	8	82	18	0	1	1	0	0	0	0
19920813	10	1	1600	1623	26	53	70	82	20	50	2	3	0	0	0	0
19920813	52	2	1127	1211	27	49	15	82	4	40	6	9	0	2	0	1
19920817	2	1	1237	1245	26	52	0	82	18	60	1	1	0	0	0	0
19920817	3	2	1314	1358	26	48	16	82	15	68	10	14	1	3	0	0
19920817	4	1	1413	1422	26	46	45	82	14	49	1	1	0	0	0	0
19920817	6	1	1556	1622	26	50	54	82	17	29	4	5	1	2	0	0
19920817	51	2	1040	1122	26	44	55	82	14	89	8	12	0	1	0	0
19920817	52	2	1214	1245	26	46	63	82	8	3	6	8	0	0	0	0
19920817	54	2	1309	1343	26	50	95	82	8	56	5	12	0	3	0	1
19920817	56	2	1422	1435	26	45	67	82	4	41	4	8	0	0	0	0
19920817	57	1	1546	1552	26	50	57	82	17	45	2	2	0	0	0	0
19920817	58	1	1618	9999	26	52	74	82	19	27	1	1	0	0	0	0
19920818	1	1	853	916	26	51	56	82	18	66	2	2	0	0	0	0
19920818	2	2	926	930	26	50	93	82	18	14	0	1	0	0	0	0
19920818	3	1	1013	1035	26	44	15	82	15	24	2	3	0	0	0	0
19920818	4	1	1044	1100	26	43	12	82	14	91	0	1	0	0	0	0
19920818	6	1	1145	1156	26	43	21	82	12	75	2	3	0	0	0	0
19920818	7	2	1206	1255	26	43	12	82	10	76	13	30	0	7	0	3
19920818	8	2	1324	1356	26	44	88	82	4	27	11	16	1	5	0	1
19920818	9	1	1407	1410	26	45	51	82	6	30	1	2	0	0	0	0
19920818	10	1	1437	1451	26	45	28	82	14	83	5	8	0	0	0	0
19920818	51	2	938	1020	26	45	58	82	9	29	3	12	0	2	0	0
19920818	53	2	1157	1205	26	52	69	82	9	69	0	2	0	0	0	0
19920818	54	2	1239	1249	26	52	24	82	9	44	1	3	0	0	0	0
19920818	56	1	1326	1332	26	46	16	82	9	14	2	2	0	0	0	0
19920818	60	2	1450	1455	26	46	28	82	14	71	4	3	0	0	0	0
19920819	2	1	1100	1114	26	42	93	82	11	34	2	2	1	1	1	1

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DATE	SIGHT#	PHOTO GRADE	TIME BEGIN	TIME END	LAT DEG	LAT MIN	LAT SEC	LONG DEG	LONG MIN	LONG SEC	TOT POSID	TOT BEST	CALF POSID	CALF BEST	YOY POSID	YOY BEST
19920819	3	2	1122	1218	26	42	84	82	10	81	8	20	1	6	0	2
19920819	4	1	1235	1246	26	42	28	82	7	24	3	5	0	2	0	2
19920819	5	2	1256	1307	26	41	50	82	6	53	2	5	0	1	0	1
19920819	6	2	1312	1336	26	41	23	82	6	35	3	9	0	2	0	2
19920819	7	1	1346	1350	26	41	17	82	6	36	1	1	0	0	0	0
19920819	10	2	1450	1500	26	39	46	82	3	93	0	2	0	0	0	0
19920819	51	1	939	1001	26	45	1	82	10	53	3	3	0	0	0	0
19920819	52	1	1010	1027	26	45	70	82	9	25	2	3	0	0	0	0
19920819	53	1	1042	1110	26	48	34	82	8	64	0	5	0	2	0	1
19920819	54	1	1151	1159	26	52	50	82	6	95	1	1	0	0	0	0
19920819	55	2	1226	1237	26	51	34	82	6	70	2	4	0	0	0	0
19920819	56	2	1252	1316	26	48	57	82	5	76	2	8	0	2	0	0
19920819	58	1	1412	1436	26	43	99	82	4	82	2	4	0	2	0	1
19920820	5	2	1205	1227	26	44	9	82	16	14	7	10	0	0	0	0
19920820	6	2	1315	1330	26	43	48	82	15	55	1	2	0	0	0	0
19920820	7	1	1345	1355	26	44	10	82	13	64	6	7	0	1	0	0
19920820	8	1	1418	1439	26	44	63	82	11	41	2	2	0	0	0	0
19920820	9	1	1450	1502	26	45	38	82	13	1	2	4	0	1	0	0
19920820	11	1	1532	1554	26	47	28	82	15	13	7	11	1	4	0	0
19920820	52	1	1002	1022	26	47	76	82	15	27	2	4	1	2	0	0
19920820	53	1	1023	1044	26	47	21	82	15	46	2	5	0	2	0	0
19920820	56	2	1302	1312	26	40	72	82	13	31	1	3	0	0	0	0
19920820	58	2	1503	1518	26	49	28	82	16	3	2	4	0	1	0	0
19920820	59	2	1612	1634	26	55	30	82	21	46	4	7	0	1	0	0
19920820	60	1	1642	1645	26	55	32	82	20	81	1	1	0	0	0	0
19920821	1	1	905	909	26	49	17	82	15	85	1	1	0	0	0	0
19920821	2	2	925	1037	26	45	79	82	12	59	9	23	0	8	0	2
19920821	4	2	1103	1113	26	46	3	82	11	61	2	4	0	1	0	0
19920821	5	1	1118	1218	26	46	20	82	10	63	2	5	0	1	0	0
19920821	6	2	1242	1250	26	45	56	82	8	31	0	1	0	0	0	0
19920821	8	1	1358	1402	26	50	28	82	16	98	1	1	0	0	0	0
19920821	51	1	922	936	26	52	62	82	19	20	2	3	0	1	0	0
19920822	51	1	1127	1142	26	48	92	82	15	42	1	2	0	1	0	0
19920828	52	1	1102	1120	26	54	65	82	20	18	2	2	0	0	0	0
19920828	53	1	1254	1305	26	55	7	82	20	71	1	2	0	0	0	0
19920828	55	1	1335	1403	26	56	36	82	21	71	3	5	0	0	0	0

DATE	SIGHT#	PHOTO GRADE	TIME BEGIN	TIME END	LAT DEG	LAT MIN	LAT SEC	LONG DEG	LONG MIN	LONG SEC	TOT POSID	TOT BEST	CALF POSID	CALF BEST	YOY POSID	YOY BEST
19930817	104	1	1330	1340	26	56	84	82	21	87	1	2	0	1	0	1
19930817	106	1	1621	1630	26	54	65	82	21	7	1	1	0	0	0	0
19930817	107	1	1639	1702	26	55	18	82	20	70	1	5	0	2	0	1
19930817	155	1	1248	1259	26	58	50	82	22	90	1	1	0	0	0	0
19930817	156	1	1304	1331	26	57	25	82	22	0	1	2	0	1	0	0
19930818	1	1	934	938	26	45	13	82	14	23	2	3	0	0	0	0
19930818	2	2	940	942	26	44	98	82	14	1	1	4	0	0	0	0
19930818	4	1	1000	1030	26	44	50	82	13	80	0	2	0	0	0	0
19930818	5	1	1035	1045	26	43	69	82	6	77	1	1	0	0	0	0
19930818	6	2	1055	1136	26	42	74	82	6	11	8	15	0	5	0	1
19930818	7	2	1207	1237	26	42	61	82	5	68	16	20	0	8	0	1
19930818	8	2	1245	1300	26	41	39	82	5	75	1	3	0	0	0	0
19930818	10	1	1335	1341	26	39	76	82	5	82	0	2	0	0	0	0
19930818	11	2	1450	1500	26	41	12	82	11	72	1	3	0	0	0	0
19930818	13	2	1645	1655	26	45	54	82	14	82	9	11	0	3	0	0
19930818	101	2	931	1000	26	45	28	82	10	60	2	3	0	0	0	0
19930818	102	2	1008	1054	26	44	93	82	8	2	4	11	0	5	0	1
19930818	103	1	1107	1118	26	44	93	82	6	20	1	1	0	0	0	0
19930818	104	2	1123	1140	26	45	46	82	5	41	0	2	0	1	0	1
19930818	105	1	1145	1200	26	45	92	82	4	80	0	2	0	1	0	0
19930818	106	2	1231	1245	26	47	86	82	4	36	0	2	0	0	0	0
19930818	108	1	1330	1350	26	56	37	82	4	96	9	13	0	0	0	0
19930818	110	1	1557	1610	26	47	20	82	15	16	1	2	0	1	0	0
19930818	151	1	903	909	26	52	56	82	18	92	2	4	0	2	0	1
19930818	152	1	924	930	26	53	79	82	19	48	1	1	0	0	0	0
19930818	153	1	933	943	26	53	91	82	19	69	0	2	0	1	0	0
19930818	154	1	949	955	26	54	26	82	19	90	1	2	0	1	0	1
19930818	155	1	1021	1029	26	55	22	82	21	26	2	3	0	0	0	0
19930818	156	1	1040	1046	26	55	76	82	21	16	1	1	0	0	0	0
19930818	158	1	1122	1132	26	57	62	82	22	31	0	1	0	0	0	0
19930818	159	1	1200	1213	26	59	37	82	23	72	1	2	0	1	0	0
19930818	160	1	1219	1230	26	58	81	82	23	29	1	2	0	1	0	0
19930818	161	1	1258	1313	26	57	5	82	21	73	1	3	0	1	0	1
19930818	162	1	1340	1353	26	54	45	82	20	0	1	2	0	1	0	1
19930818	163	2	1439	1450	26	48	92	82	16	70	0	1	0	0	0	0
19930818	164	1	1519	1534	26	49	19	82	15	70	1	1	0	0	0	0

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DATE	SIGHT#	PHOTO GRADE	TIME BEGIN	TIME END	LAT DEG	LAT MIN	LAT SEC	LONG DEG	LONG MIN	LONG SEC	TOT POSID	TOT BEST	CALF POSID	CALF BEST	YOY POSID	YOY BEST
19930819	1	2	935	955	26	44	29	82	13	60	0	4	0	1	0	0
19930819	3	2	1038	1048	26	41	51	82	5	30	4	14	0	6	0	0
19930819	4	1	1216	1223	26	41	5	82	12	28	1	1	0	0	0	0
19930819	5	1	1258	9999	26	40	20	82	13	19	0	2	0	0	0	0
19930819	6	2	1406	1430	26	42	50	82	14	18	11	16	0	4	0	0
19930819	8	2	1454	1514	26	42	76	82	11	44	8	10	0	0	0	0
19930819	9	1	1616	1621	26	51	41	82	18	5	1	1	0	0	0	0
19930819	101	1	940	958	26	45	35	82	6	79	7	9	0	1	0	0
19930819	102	2	1041	1108	26	54	85	82	9	47	6	10	0	2	0	0
19930819	103	2	1215	1245	26	54	66	82	6	41	11	16	0	3	0	0
19930819	151	1	923	940	26	50	12	82	17	10	1	1	0	0	0	0
19930819	152	2	1005	1025	26	46	98	82	14	72	0	1	0	0	0	0
19930819	153	1	1107	1130	26	46	4	82	10	90	1	6	0	3	0	2
19930819	154	1	1240	1314	26	43	48	82	15	10	2	2	0	0	0	0
19930819	155	1	1345	1402	26	45	0	82	14	90	4	4	0	0	0	0
19930819	156	1	1439	1455	26	47	12	82	15	12	2	2	1	1	0	0
19930819	157	2	1600	1610	26	51	55	82	18	60	3	6	0	3	0	2
19930820	1	1	945	950	26	44	30	82	9	79	1	1	0	0	0	0
19930820	2	2	950	1000	26	45	30	82	9	79	4	8	0	0	0	0
19930820	3	1	1000	1005	26	44	54	82	9	50	2	3	0	0	0	0
19930820	4	2	1005	1015	26	44	69	82	9	48	2	5	0	0	0	0
19930820	5	1	1025	1030	26	47	99	82	7	78	1	1	0	0	0	0
19930820	6	2	1035	1050	26	44	91	82	7	88	1	3	0	0	0	0
19930820	7	1	1110	1140	26	43	70	82	4	70	6	9	0	1	0	0
19930820	8	2	1155	1200	26	46	89	82	4	18	4	6	0	0	0	0
19930820	9	1	1320	1335	26	41	73	82	5	75	2	4	0	1	0	0
19930820	11	1	1355	1400	26	42	42	82	7	19	2	2	1	1	0	0
19930820	12	2	1401	1410	26	42	47	82	6	99	3	5	0	1	0	0
19930820	13	2	1445	1450	26	41	55	82	14	63	0	1	0	0	0	0
19930820	14	2	1501	1513	26	40	26	82	12	26	0	1	0	0	0	0
19930820	101	1	955	1004	26	49	13	82	6	45	2	3	0	1	0	0
19930820	103	1	1034	1043	26	46	49	82	5	99	1	1	0	0	0	0
19930820	104	1	1241	1254	26	48	32	82	8	61	4	6	1	2	0	0
19930820	105	1	1319	1341	26	54	21	82	10	26	0	2	0	0	0	0
19930820	151	1	850	902	26	52	6	82	18	60	2	4	0	2	0	1
19930820	152	1	920	937	26	50	10	82	15	40	3	6	1	3	0	1

DATE	SIGHT#	PHOTO GRADE	TIME BEGIN	TIME END	LAT DEG	LAT MIN	LAT SEC	LONG DEG	LONG MIN	LONG SEC	TOT POSID	TOT BEST	CALF POSID	CALF BEST	YOY POSID	YOY BEST
19930820	153	1	942	955	26	45	90	82	15	31	2	2	0	0	0	0
19930820	154	1	1015	1044	26	45	66	82	10	94	4	5	1	2	0	0
19930820	156	1	1120	1135	26	44	98	82	14	50	2	2	0	0	0	0
19930820	157	2	1150	1215	26	44	92	82	15	0	3	5	0	1	0	0
19930820	158	2	1230	1320	26	42	61	82	16	30	12	18	0	4	0	1
19930820	159	1	1335	1340	26	46	40	82	12	58	1	1	0	0	0	0
19930820	160	1	1405	1422	26	47	68	82	14	10	1	6	0	3	0	1
19930820	161	1	1530	1536	26	53	90	82	20	15	1	1	0	0	0	0
19930820	162	1	1555	1615	26	55	40	82	20	70	1	2	0	1	0	0
19930822	102	2	1320	1347	26	41	18	82	13	60	3	9	0	4	0	0
19930822	103	2	1415	1445	26	38	59	82	12	12	4	16	0	5	0	0
19930823	1	1	1055	1110	26	44	55	82	15	25	3	4	0	1	0	0
19930823	3	2	1220	1240	26	41	10	82	12	45	0	1	0	0	0	0
19930823	4	1	1245	1255	26	40	90	82	12	25	1	4	0	1	0	0
19930823	5	2	1410	1430	26	41	20	82	11	58	1	2	0	0	0	0
19930823	6	1	1440	1450	26	40	40	82	12	80	1	5	0	2	0	0
19930823	7	1	1510	1520	26	45	80	82	15	68	1	1	0	0	0	0
19930823	101	1	1006	1015	26	51	50	82	18	20	4	6	0	2	0	1
19930823	102	1	1045	1120	26	45	87	82	14	8	10	15	1	5	0	0
19930823	103	1	1130	1150	26	45	48	82	13	86	4	6	0	2	0	1
19930823	105	2	1311	1329	26	48	0	82	8	46	7	11	0	1	0	0
19930823	106	2	1358	1410	26	55	15	82	10	54	0	2	0	1	0	0
19930823	107	1	1440	1450	26	55	10	82	9	98	3	4	0	1	0	0
19930823	108	2	1603	1619	26	47	33	82	15	19	7	15	1	6	0	1
19930823	151	1	1007	1018	26	53	62	82	19	36	1	1	0	0	0	0
19930823	152	1	1023	1043	26	54	18	82	19	83	2	4	0	2	0	2
19930823	153	1	1140	1156	26	58	11	82	22	75	1	2	0	1	0	0
19930823	154	1	1211	1220	26	56	5	82	21	25	0	1	0	0	0	0
19930823	155	1	1315	1332	26	53	9	82	19	37	1	1	0	0	0	0
19930823	156	1	1341	1350	26	52	89	82	19	20	1	1	0	0	0	0
19930823	157	1	1428	1446	26	49	50	82	16	33	1	2	0	1	0	0
19930823	158	1	1516	1537	26	47	70	82	15	59	2	5	1	2	0	0
19930824	1	2	921	926	26	43	30	82	9	96	0	1	0	0	0	0
19930824	11	1	1403	1409	26	37	7	82	12	39	2	2	0	0	0	0
19930824	101	2	959	1042	26	52	39	82	4	31	3	9	0	3	0	0
19930824	102	1	1103	1116	26	49	92	82	4	42	2	5	0	1	0	0

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DATE	SIGHT#	PHOTO GRADE	TIME BEGIN	TIME END	LAT DEG	LAT MIN	LAT SEC	LONG DEG	LONG MIN	LONG SEC	TOT POSID	TOT BEST	CALF POSID	CALF BEST	YOY POSID	YOY BEST
19930824	103	2	1241	1309	26	57	0	82	11	64	6	10	0	3	0	0
19930824	104	1	1345	1416	26	52	35	82	9	45	13	15	0	0	0	0
19930824	152	1	1135	1205	26	46	65	82	10	14	4	6	1	2	0	1
19930824	154	1	1320	1335	26	44	78	82	15	13	1	1	0	0	0	0
19930824	155	2	1350	1405	26	45	25	82	15	22	4	8	0	3	0	1
19930824	157	1	1500	1525	26	49	61	82	16	51	3	6	1	2	0	1
19930825	1	2	957	1018	26	43	81	82	11	34	1	3	0	0	0	0
19930825	2	1	1022	1030	26	43	88	82	10	95	0	2	0	1	0	0
19930825	3	1	1105	1116	26	44	1	82	5	81	1	1	0	0	0	0
19930825	4	1	1145	1156	26	42	78	82	8	3	1	1	0	0	0	0
19930825	5	1	1208	1221	26	43	18	82	5	29	2	3	0	0	0	0
19930825	6	1	1258	1311	26	42	64	82	7	61	3	5	0	2	0	0
19930825	101	2	957	1016	26	45	70	82	4	43	2	4	0	1	0	0
19930825	103	1	1158	1219	26	45	49	82	7	39	0	2	0	0	0	0
19930825	104	1	1257	1316	26	44	11	82	10	52	2	4	0	2	0	0
19930825	151	1	900	908	26	51	22	82	18	31	1	2	0	1	0	1
19930825	152	1	911	935	26	51	12	82	18	22	3	4	0	1	0	0
19930825	153	1	949	957	26	49	86	82	16	47	2	3	0	0	0	0
19930825	154	1	1000	1010	26	49	67	82	16	43	1	1	0	0	0	0
19930825	155	2	1015	1031	26	49	31	82	15	89	0	2	0	0	0	0
19930825	156	1	1032	1053	26	49	30	82	15	88	4	6	0	1	0	0
19930825	157	1	1102	1129	26	47	12	82	15	2	3	5	0	2	0	0
19930825	158	1	1144	1149	26	47	11	82	15	3	1	1	0	0	0	0
19930825	159	2	1218	1306	26	46	0	82	10	40	5	14	0	4	0	1
19930826	2	2	1208	1241	26	45	40	82	8	75	4	7	0	2	0	2
19930826	151	2	903	928	26	54	70	82	20	20	1	2	0	0	0	0
19930826	152	1	957	1006	26	59	62	82	24	10	0	1	0	0	0	0
19930827	1	1	942	1006	26	52	86	82	19	45	1	2	0	1	0	0
19930827	2	1	1010	1057	26	53	21	82	19	63	3	3	0	0	0	0
19930827	3	1	1116	1129	26	54	69	82	20	22	2	2	0	0	0	0
19930827	4	1	1135	1151	26	56	31	82	21	62	1	2	0	1	0	0
19930827	5	1	1202	1212	26	59	20	82	23	74	1	2	0	1	0	0
19930827	6	1	1214	1230	26	59	75	82	24	28	1	3	0	1	0	0

DATE	SIGHT#	PHOTO GRADE	TIME BEGIN	TIME END	LAT DEG	LAT MIN	LAT SEC	LONG DEG	LONG MIN	LONG SEC	TOT POSID	TOT BEST	CALF POSID	CALF BEST	YOY POSID	YOY BEST
19940801	3	1	1351	1426	26	56	78	82	21	90	17	21	0	4	0	0
19940801	52	1	1440	1458	26	56	40	82	21	58	1	3	0	1	0	0
19940801	53	1	1512	1521	26	54	9	82	19	98	3	4	0	1	0	0
19940801	54	1	1539	1546	26	53	90	82	20	30	2	2	0	0	0	0
19940802	1	1	910	920	26	45	71	82	14	77	1	1	0	0	0	0
19940802	2	1	924	931	26	45	71	82	14	77	1	2	0	1	0	0
19940802	3	2	939	952	26	44	8	82	15	14	2	3	0	0	0	0
19940802	5	1	1055	1113	26	39	86	82	5	86	1	3	0	0	0	0
19940802	6	2	1135	1145	26	39	47	82	5	76	0	1	0	0	0	0
19940802	7	1	1151	1200	26	40	23	82	6	36	1	1	0	0	0	0
19940802	8	2	1213	1310	26	44	26	82	4	88	24	35	1	10	0	3
19940802	9	1	1323	1329	26	44	39	82	9	17	0	1	0	0	0	0
19940802	10	2	1343	1347	26	44	26	82	13	28	2	3	0	0	0	0
19940802	11	2	1353	1402	26	44	41	82	13	80	1	3	0	1	0	0
19940802	12	1	1413	1425	26	45	15	82	13	40	2	3	0	1	0	1
19940802	51	2	937	1000	26	45	74	82	4	40	3	6	0	1	0	0
19940802	54	2	1145	1222	26	52	4	82	3	63	1	5	0	2	0	1
19940802	56	1	1258	1304	26	54	61	82	6	7	2	2	0	0	0	0
19940802	57	2	1350	1411	26	49	2	82	6	40	0	3	0	0	0	0
19940802	101	2	955	1010	26	43	41	82	15	10	3	5	0	0	0	0
19940802	102	1	1115	1135	26	48	93	82	15	15	0	2	0	1	0	0
19940802	103	1	1215	1240	26	46	33	82	13	95	1	1	0	0	0	0
19940802	105	1	1350	1400	26	45	81	82	13	65	3	4	0	1	0	0
19940802	106	1	1400	1420	26	45	85	82	13	43	2	4	0	0	0	0
19940802	107	1	1448	1451	26	48	6	82	15	37	0	1	0	0	0	0
19940802	108	1	1525	1535	26	50	55	82	17	54	3	3	0	0	0	0
19940803	1	2	1005	1037	26	38	67	82	13	12	3	5	0	0	0	0
19940803	2	2	1051	1110	26	39	15	82	12	4	1	3	0	1	0	0
19940803	3	2	1137	1153	26	41	49	82	11	54	1	2	0	0	0	0
19940803	4	2	1225	1258	26	42	85	82	5	55	17	30	1	13	0	1
19940803	52	2	1058	1116	26	52	44	82	4	27	1	3	0	0	0	0
19940803	53	2	1214	1242	26	51	15	82	4	36	16	18	0	5	0	2
19940803	102	2	1059	1134	26	46	20	82	13	27	4	7	0	3	0	1
19940803	104	1	1244	1253	26	47	84	82	15	14	0	1	0	0	0	0
19940803	105	1	1751	1757	26	54	95	82	20	35	1	1	0	0	0	0
19940803	106	2	1759	1807	26	55	12	82	20	80	0	2	0	1	0	1

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DATE	SIGHT#	PHOTO GRADE	TIME BEGIN	TIME END	LAT DEG	LAT MIN	LAT SEC	LONG DEG	LONG MIN	LONG SEC	TOT POSID	TOT BEST	CALF POSID	CALF BEST	YOY POSID	YOY BEST
19940803	107	2	1814	1825	26	56	49	82	21	72	0	1	0	0	0	0
19940803	109	1	1837	1843	26	57	52	82	22	49	1	2	0	1	0	0
19940803	110	1	1847	1850	26	57	88	82	22	62	1	1	0	0	0	0
19940803	111	1	1854	1858	26	57	97	82	22	79	1	2	0	1	0	0
19940803	112	1	1903	1911	26	58	68	82	23	27	0	2	0	1	0	0
19940803	113	1	1915	1918	26	59	52	82	24	0	0	1	0	0	0	0
19940804	1	2	932	951	26	41	44	82	13	90	2	6	0	3	0	1
19940804	3	1	1059	1116	26	40	48	82	11	97	0	2	0	1	0	1
19940804	4	1	1146	1202	26	42	73	82	11	17	1	3	0	1	0	0
19940804	7	2	1321	1334	26	43	75	82	4	98	0	4	0	2	0	1
19940804	9	1	1509	1526	26	45	6	82	14	91	1	2	0	1	0	0
19940804	51	1	916	923	26	45	88	82	4	16	1	1	0	0	0	0
19940804	52	1	927	941	26	46	28	82	4	7	2	3	0	0	0	0
19940804	53	2	955	1008	26	49	77	82	4	34	1	2	0	0	0	0
19940804	54	1	1132	1147	26	56	10	82	10	89	0	1	0	0	0	0
19940804	55	1	1158	1208	26	54	51	82	10	28	4	5	0	0	0	0
19940804	56	2	1216	1230	26	54	63	82	10	46	3	5	0	0	0	0
19940804	57	2	1244	1317	26	53	95	82	9	22	6	15	0	2	0	0
19940804	58	1	1330	1334	26	52	92	82	8	50	1	1	0	0	0	0
19940804	59	1	1345	1354	26	50	35	82	7	53	0	1	0	0	0	0
19940804	60	2	1415	1423	26	50	92	82	8	99	0	2	0	1	0	1
19940804	101	1	847	859	26	54	16	82	20	7	1	2	0	1	0	0
19940804	103	1	1012	1021	26	48	54	82	15	98	1	3	0	1	0	0
19940804	104	1	1053	1108	26	47	11	82	14	4	1	1	0	0	0	0
19940804	105	1	1108	1120	26	46	72	82	13	81	2	2	0	0	0	0
19940804	106	2	1223	1243	26	46	85	82	11	4	0	2	0	0	0	0
19940804	107	2	1257	1311	26	46	0	82	11	36	1	4	0	1	0	1
19940804	108	1	1313	1332	26	45	93	82	11	58	4	7	0	2	0	1
19940804	109	1	1344	1350	26	45	73	82	13	25	1	1	0	0	0	0
19940805	1	1	848	905	26	50	29	82	17	2	2	3	0	1	0	0
19940805	2	1	931	938	26	46	78	82	14	96	1	1	0	0	0	0
19940805	4	2	1022	1032	26	45	88	82	14	29	0	3	0	0	0	0
19940805	5	1	1034	1113	26	46	12	82	13	43	3	6	0	1	0	1
19940805	7	1	1130	1145	26	47	41	82	14	10	2	3	0	0	0	0
19940805	8	1	1145	1151	26	47	41	82	14	10	3	4	0	0	0	0
19940805	9	1	1156	1200	26	47	41	82	14	27	1	1	0	0	0	0

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DATE	SIGHT#	PHOTO GRADE	TIME BEGIN	TIME END	LAT DEG	LAT MIN	LAT SEC	LONG DEG	LONG MIN	LONG SEC	TOT POSID	TOT BEST	CALF POSID	CALF BEST	YOY POSID	YOY BEST
19940805	10	1	1203	1207	26	47	30	82	14	48	1	1	0	0	0	0
19940805	11	1	1213	1218	26	47	7	82	15	24	1	1	0	0	0	0
19940805	12	1	1414	1426	26	58	15	82	22	65	5	7	0	2	0	0
19940805	13	1	1457	1509	26	57	18	82	22	17	1	2	0	1	0	0
19940805	14	2	1526	1539	26	54	25	82	20	2	5	7	0	0	0	0
19940805	52	1	934	944	26	48	17	82	5	25	1	5	0	1	0	0
19940805	53	1	945	948	26	48	24	82	5	25	3	3	0	0	0	0
19940805	55	2	1011	1019	26	50	80	82	5	11	0	3	0	0	0	0
19940805	56	2	1035	1046	26	54	86	82	8	93	3	5	0	1	0	0
19940805	57	2	1056	1103	26	51	92	82	8	42	0	2	0	1	0	0
19940805	58	1	1109	1121	26	50	60	82	7	89	2	2	0	0	0	0
19940805	59	1	1124	1129	26	50	64	82	7	62	1	2	0	1	0	1
19940805	60	1	1154	1204	26	51	87	82	9	38	0	1	0	0	0	0
19940805	61	1	1206	1212	26	52	36	82	9	35	0	2	0	1	0	0
19940805	62	1	1219	1236	26	53	54	82	9	96	2	5	0	2	0	0
19940805	63	1	1249	1304	26	53	95	82	10	6	1	6	0	1	0	0
19940805	101	1	848	855	26	53	90	82	19	75	1	2	0	1	0	0
19940805	103	2	1019	1037	26	43	38	82	10	39	0	2	0	0	0	0
19940805	104	2	1053	1109	26	44	94	82	6	35	0	2	0	1	0	0
19940805	105	2	1137	1209	26	45	54	82	6	1[illegible]	5	8	0	3	0	1
19940805	106	2	1235	1246	26	45	82	82	7	62	6	9	0	0	0	0
19940805	107	2	1247	1305	26	45	70	82	8	15	2	5	1	1	0	0
19940805	108	1	1415	1444	26	47	45	82	15	13	5	7	0	0	0	0
19940805	109	1	1506	1517	26	51	77	82	18	62	1	2	0	1	0	0
19940806	51	1	1115	1130	26	49	22	82	15	65	3	3	1	1	0	0
19940806	52	1	1145	1220	26	46	90	82	14	50	3	5	0	2	0	0
19940806	53	1	1410	1440	26	46	17	82	10	21	7	7	0	0	0	0
19940806	54	1	1455	1515	26	45	45	82	13	89	8	12	0	3	0	0
19940808	2	1	1058	1129	26	44	56	82	15	15	0	2	0	1	0	0
19940808	3	1	1116	1129	26	44	58	82	15	20	0	2	0	1	0	0
19940808	4	1	1151	1217	26	47	71	82	15	65	2	2	0	0	0	0
19940808	5	1	1243	1306	26	48	35	82	15	83	0	2	0	1	0	0
19940808	6	1	1333	1336	26	47	95	82	15	44	0	1	0	0	0	0
19940808	7	1	1404	1412	26	49	54	82	16	48	1	1	0	0	0	0
19940808	8	1	1425	1439	26	51	27	82	18	32	2	3	0	1	0	0
19940808	9	1	1458	1523	26	53	91	82	19	79	5	7	1	3	0	0

Sighting Data 1994

DATE	SIGHT#	PHOTO GRADE	TIME BEGIN	TIME END	LAT DEG	LAT MIN	LAT SEC	LONG DEG	LONG MIN	LONG SEC	TOT POSID	TOT BEST	CALF POSID	CALF BEST	YOY POSID	YOY BEST
19940808	51	1	1016	1025	26	48	39	82	6	53	1	1	0	0	0	0
19940808	53	1	1141	1150	26	56	48	82	3	82	0	3	0	1	0	0
19940808	54	2	1255	1316	26	46	79	82	4	19	1	5	0	2	0	0
19940808	55	2	1340	1420	26	47	49	82	8	54	7	10	0	3	0	0
19940808	101	1	1014	1041	26	43	89	82	15	24	9	11	0	1	0	0
19940808	102	2	1057	1105	26	42	80	82	15	91	2	3	0	0	0	0
19940808	103	1	1106	1111	26	42	80	82	15	84	1	2	0	0	0	0
19940808	104	1	1131	1150	26	43	61	82	10	23	3	4	0	1	0	0
19940808	105	2	1152	1201	26	43	56	82	10	71	4	7	0	0	0	0
19940808	107	2	1317	1345	26	40	99	82	11	59	4	8	0	2	0	0
19940808	108	1	1351	1359	26	40	73	82	11	82	1	4	0	0	0	0
19940808	109	1	1414	1421	26	40	94	82	13	75	1	1	0	0	0	0
19940808	110	1	1443	1504	26	43	11	82	14	43	3	5	0	0	0	0
19940808	111	1	1532	1545	26	46	70	82	13	18	1	1	0	0	0	0
19940809	2	1	1006	1017	26	42	85	82	13	54	1	3	0	0	0	0
19940809	3	2	1026	9999	26	42	89	82	11	16	0	2	0	1	0	0
19940809	4	1	1052	1115	26	43	32	82	10	17	1	2	0	1	0	0
19940809	5	1	1115	1142	26	43	34	82	9	36	5	5	0	0	0	0
19940809	7	2	1228	1231	26	42	74	82	7	98	0	1	0	0	0	0
19940809	8	1	1325	1359	26	41	68	82	6	55	7	9	1	2	0	0
19940809	9	2	1402	1426	26	41	91	82	5	70	0	2	0	0	0	0
19940809	52	2	1016	1027	26	46	75	82	6	36	0	1	0	0	0	0
19940809	53	1	1034	1053	26	46	50	82	5	55	1	2	0	1	0	0
19940809	54	2	1053	1106	26	48	91	82	5	56	0	2	0	0	0	0
19940809	55	1	1138	1145	26	56	83	82	6	76	0	1	0	0	0	0
19940809	56	1	1200	1220	26	55	5	82	9	65	1	5	0	2	0	1
19940809	57	2	1414	1426	26	46	23	82	4	27	3	8	0	3	0	1
19940809	58	1	1443	1452	26	47	1	82	4	27	7	8	1	2	0	0
19940809	60	2	1510	1535	26	48	22	82	4	62	13	20	0	0	0	0
19940809	61	2	1555	1600	26	47	8	82	8	66	0	1	0	0	0	0
19940809	101	1	854	936	26	52	57	82	19	10	2	4	0	2	0	0
19940809	102	1	945	1000	26	53	82	82	20	36	1	3	0	1	0	0
19940809	111	2	1259	1340	26	46	20	82	14	73	7	10	1	3	0	2
19940809	112	1	1346	1400	26	46	22	82	14	73	1	2	0	1	0	0
19940809	113	2	1400	1411	26	47	91	82	15	0	1	2	0	0	0	0
19940809	114	1	1411	1423	26	48	13	82	15	35	0	1	0	0	0	0

DATE	SIGHT#	PHOTO GRADE	TIME BEGIN	TIME END	LAT DEG	LAT MIN	LAT SEC	LONG DEG	LONG MIN	LONG SEC	TOT POSID	TOT BEST	CALF POSID	CALF BEST	YOY POSID	YOY BEST
19940809	115	1	1445	1459	26	49	9	82	15	85	2	6	0	2	0	0
19940809	116	1	1500	1509	26	48	96	82	15	65	4	7	1	3	0	0
19940809	117	1	1515	1528	26	49	51	82	15	83	2	2	0	0	0	0
19940809	118	1	1536	1547	26	49	88	82	17	24	1	2	0	1	0	0
19940809	119	1	1610	1637	26	55	6	82	20	72	3	4	0	0	0	0
19940810	2	1	1022	1040	26	36	70	82	13	15	0	1	0	0	0	0
19940810	3	1	1042	1046	26	36	75	82	13	4	2	2	0	0	0	0
19940810	4	1	1058	1105	26	39	62	82	13	14	1	2	0	1	0	0
19940810	5	2	1106	1113	26	39	54	82	13	17	2	4	0	1	0	0
19940810	6	1	1130	1149	26	40	40	82	13	33	1	2	0	0	0	0
19940810	7	1	1200	1216	26	41	57	82	14	59	0	2	0	1	0	1
19940810	8	2	1221	1239	26	41	16	82	11	57	2	3	0	0	0	0
19940810	9	1	1302	1315	26	40	42	82	13	99	1	2	0	1	0	0
19940810	10	1	1335	1341	26	40	23	82	13	19	1	3	0	0	0	0
19940810	52	2	1135	1138	26	54	43	82	10	27	6	8	0	2	0	1
19940810	53	1	1218	1232	26	45	89	82	4	18	2	4	0	0	0	0
19940810	101	1	851	901	26	52	52	82	19	10	1	2	0	1	0	0
19940810	102	1	928	945	26	58	18	82	22	84	3	6	0	2	0	0
19940810	103	1	1034	1044	26	58	82	82	23	47	1	2	0	1	0	0
19940810	104	1	1101	1114	26	58	25	82	22	75	4	7	0	3	0	0
19940810	105	1	1123	1144	26	55	62	82	21	27	1	3	0	1	0	0
19940811	4	1	1130	1145	26	36	75	82	13	11	1	5	0	0	0	0
19940811	5	1	1147	1201	26	36	70	82	13	20	0	1	0	0	0	0
19940811	6	2	1234	1302	26	40	92	82	14	66	2	3	0	0	0	0
19940811	51	2	957	1020	26	47	8	82	4	9	2	3	0	1	0	0
19940811	52	2	1020	1043	26	46	96	82	4	52	1	5	0	0	0	0
19940811	53	1	1123	1139	26	53	92	82	6	15	1	2	0	1	0	0
19940811	54	2	1142	1159	26	54	2	82	6	25	2	6	0	2	0	0
19940811	101	1	859	909	26	51	17	82	18	26	1	2	0	1	0	0
19940811	102	1	922	928	26	50	50	82	16	59	2	2	0	0	0	0
19940811	103	1	928	946	26	50	20	82	16	52	4	5	0	1	0	0
19940811	104	1	1001	1007	26	49	39	82	15	87	1	2	0	1	0	0
19940811	106	1	1038	1058	26	49	52	82	17	1	2	2	0	0	0	0
19940811	110	1	1350	1405	26	47	13	82	14	3	3	4	0	0	0	0
19940812	101	1	842	850	26	51	7	82	18	19	1	2	0	1	0	0
19940812	103	1	932	949	26	48	54	82	17	10	2	3	0	1	0	0

DATE	SIGHT#	DOLPHIN CODES
19900810	53	TBTS BULB
19900810	54	BBUK
19900812	52	BOBN
19900812	53	
19900812	54	THUV LNSE LOSC HISC RPPR BITP TSMD TSC1
19900812	51A	MDLB RY34
19900812	51B	MDLB RY34
19900813	4	LSHB BKBS TSCS
19900813	5	FANT
19900813	51	TBTS BULB
19900813	52	TBTS UTLS BULB
19900813	53	PTBK TMSC
19900814	1	PTBK
19900814	2	LSHB CURL LDTP SOTT
19900814	3	FANT BULB
19900814	4	DIPT
19900814	5	RPPR BOBN TPLO
19900814	6	SHSP SHSC
19900814	7	
19900814	8	FTSE
19900814	51	STIM BLNT NESE
19900814	52	VAMP SNRM HWCS MSBC TALK MSBH TATT
19900814	53	
19900815	1	
19900815	2	SHSP SHSC FTSE TBTS TPLO BULB HWCS
19900815	3	HLSB SNRM
19900815	4	
19900815	6	FRTK TBLS
19900815	53	BFTB
19900815	54	LDTP SOTT
19900816	1	DIPT
19900816	2	HISC
19900816	5	TALK BOBN HIPF HRMN TPTS SLIT BKTL SPTP FTHS SMFT PKUP WHTP TWSP BFBT TAPR PMID HISP HSPE HFTP WHMR TINW OBLA
19900816	6	LOSC ANFO BITP SMRF MLSC
19900816	51	MTSP SMRF BFTB FMTH
19900816	53	BOFF
19900816	54	BOFF STPN KNHL
19900816	55	ZIGY
19900816	56	SCST BXBK SQGL KBFN PRLN PIGN
19900816	60	FLBU RMRL
19900816	4A	CLTO NESE STIM BLNT MLSC HWCS
19900816	57A	PTCS LDHN BXBK SKTH SQGL KBFN NODY
19900817	1	BUUD
19900817	2	RPPR THUV LEHT BUUD TSMD TSC1
19900817	3	BKBS UPS2

DATE	SIGHT#	DOLPHIN CODES
19900817	4	SPTP STPN TWSP TWSC TMSC LDMV
19900817	5	MTMS SBKB CNOF MATT BKTP SBSR OPUS ZIGY PRLN
19900817	6	TMPN ESCL WING
19900817	7	ESCL WING TTBK
19900817	58	BUUD LEHT TPLO RPPR TMBL
19900818	1	LAHS
19900818	4	TFLN LSPN
19900818	7	TNLS
19900818	51	THUV
19900818	52	THUV LOSC BITP ANFO TPMI TSMD TSC1
19900818	53	CLTP
19900818	54	FAFG BFSS NELS PNTP ETPL
19900820	1	TSCS BKBS BULB
19900820	52	BFTB
19900821	8	THUV
19900822	1	LDTP SOTT
19900822	6	MUNI HNMI
19900822	7	BBUK LOSC
19900822	8	PTBK
19900822	51	LDTP SOTT
19900822	52	NESE STIM KNHL BLNT LDMV TNSB
19900822	55	
19900822	56	DTLA POTP SBMS
19900822	9A	CURL LSHB
19900822	9B	CURL LSHB
19900823	4	SQUA CMNK
19900823	5	PACM POT2
19900823	6	DEVL GOAT HSLI
19900823	7	BLND HAIG LEHT FMTH NALS TSMD SHLO CVLS LAHS MSBU WBMA LDLS FMTC TSC1 SHC1
19900823	51	LDTP SOTT
19900823	52	
19900823	53	RY34 LNSE TMSC HISC
19900823	54	MATT SMCO LATP FTMB RTLS
19900823	55	BTIT PIGN
19900823	56	RMRL SQFL SQFC MOUN SCST BUCK DOBS PMCH ETBP RLBK MTAB FLLS WAVY BELL VOLT APLA
19900824	1	TMSC HISC LOSC UWMN ANFO BITP
19900824	2	
19900824	3	YAFT
19900824	51	FTSE LDTP LAHS SOTT
19900824	54	LDMV ZIGY LBTM LBTC BMWL HWCS LOWV NELA BUNB BFMD STBK TMPN BNSC CHOF RHNO ESCL
19900826	1	TMSC HLSB HISC RY34 LNSE LNSC BITP MSPN LOSC ANFO
19900826	2	BEAK NELA BUNB MSBH MSBC VAMP VNKS HSOC TALK SNRM SUBK BFMD FLTB TATT BFSS
19900826	3	TMPN USBK
19900826	6	
19900826	7	LONS

DATE	SIGHT#	DOLPHIN CODES
19900826	53	TNLS
19900826	54	TNLS TFLN CRES USMV
19900826	55	TFLN TNLS GOAT DEVL BWDG FLPR HSL1 USMV FNTP
19900826	56	CLTO CNOF HWCS APFA SBBS TMWV ETBP
19900826	5A	MATT WING VOLT DOBS LCLG BFMS BFBT ESCL
19900826	5B	BFBT SOAR PNTP BUCK VOLT MFLA FLLS NELS
19900827	1	LBLT BULB TBTN
19900827	7	
19900827	8	CURL BHNL
19900827	52	
19900827	53	FLTB SBKB ZIGY BKTP VAVM WAVY
19900827	55	RTLS NESE STIM BLNT LOSC SMCO BITP TSMD TSC1 SHLO SHC1 ANFO
19900828	51	LSHB BHNL

DATE	SIGHT#	DOLPHIN CODES
19910810	2	CURL BBUK TBTN HOSP FANT BFTB BRDO RPPI
19910811	2	CNOF
19910811	3	UBPN
19910811	53	LBTM LBTC MSPN UPS2 LDTS
19910812	51	LDTP SOTT
19910812	52	
19910812	54	LOWV BUCK BUNB PMCH LPSP
19910812	56	MTMS LNDE
19910812	58	
19910812	59	POTP LETR GROV SHDE
19910812	151	
19910812	152	FLAX SBKB VARS
19910812	153	HFTP BXLB BELL USBK TMPN
19910812	155	
19910812	158	LDTS BUST RLBK
19910814	1	
19910814	2	FRTK TBLS
19910814	3	LDTP SOTT
19910814	4	TPMI TPMC LNSE HISC TSMD TMDC TMBL TMBC FMTH BITP FMTC WBMA WBCC
19910814	5	LBLT LBLC BULB TBTS PTBK FHIS FHIC MPIN BKBS BKBC TSCS
19910814	51	TRTH MWMA MWMC SLST USMS FLBU
19910814	52	CURL TBTN BBUK HOSP MDLB
19910814	53	BBUK MDLB TBTN
19910815	52	SEAL LHLA BUBD BUBC SLST
19910815	54	BFLA MICO SNST
19910815	151	FRTK TBLS
19910815	152	RPPR LNSE HISC LNSC TPMI TPMC RTLS TMSC SMCO
19910815	153	FMTH HWCS MTSP FMTC WBMA WBCC
19910815	155	MTSP
19910815	156	LDMV CHOF SHTS LEHN
19910815	159	CRES PTMS
19910815	160	TAGL TAGC SHLO BASC HSLI MLDG
19910815	161	LETR DASP SILA POTP GROV
19910815	162	RY34
19910817	51	LDTP SOTT
19910818	1	SHTS ETBP
19910818	3	BUBO BFBT
19910818	4	SQGL
19910818	5	TSLD MWMA MWMC
19910818	6	SBMS
19910818	7	MICO SNST
19910818	9	RORQ FAFG LSFL ROMN LSFC YAWT BRLN DNNK
19910818	52	VNAB UBLV
19910818	53	FLAX LSFL BUCK PMCH BELL DOBS SCST DBNK FLLS APLA HILD

DATE	SIGHT#	DOLPHIN CODES
19910818	54	
19910819	1	MDLB
19910819	3	RY34 LDMV TMSC BMWL STBK YAPL
19910819	7	PACM ZIGY SBKB RY34 NIBB BFSS TWPF MSMA MSMC TRTP
19910819	51	HSRE
19910820	2	TBTS BULB
19910821	1	UBPN CHIP
19910821	3	TAGL PLAT TAGC CMNK BWDG FLPR TNLS
19910821	4	LEVM LEVC PLAT PACH PACC RTLV LOMA BELD
19910821	5	
19910821	6	
19910821	51	
19910821	52	
19910824	51	CURL DIPT MTSP SLMS SBLS LEMO BHNL
19910824	52	CURL MTSP SLMS DIPT BBUK LSHB BKBS TSCS LOSC BHNL
19910825	1	LNSE HISC
19910826	4	TOHA SCOO
19910826	5	
19910826	6	BELD LEVM PACH PACC LEVC KNHL LPSP SILA BELC LSMN
19910826	7	BRON BPNM BPNC
19910826	54	MTSP MTSC FMTH FMTC LDTP SOTT BITP ANFO
19910827	1	BOBN FTSE HOSP MPIN BBUK TBTS BULB TSCS SBLS LBLT LBLC BKBS BKBC

DATE	SIGHT#	DOLPHIN CODES
19920811	1	
19920811	2	LNSE LNSC TMBL TMBC TPLO SMRF SOTT
19920811	3	BFTB
19920811	55	CURL LSHB
19920813	1	RY34
19920813	2	
19920813	5	SILM
19920813	6	RY34 HAIG TMBL TMBC MSPN BELD HWPD UTRS
19920813	8	BPNM BPNC
19920813	9	BFTB
19920813	10	HSLR SLMS
19920813	52	FTPN NODY SKTH SBMS MIDT SCDS
19920817	2	BOBN
19920817	3	TPMI HISC LNSE TMBL TMBC BLND SHLO CVLS HWPD TPMC SMRF
19920817	4	YAFT
19920817	6	LDTP SOTT MTSP FMTC FMTH
19920817	51	STIM CLTO BLNT STBK NESE FLTB MLSC TLLA
19920817	52	ETBP MATT TDTN PRNU TTIM FLBU
19920817	54	SOAR WIZA LDRO EDSC LONS
19920817	56	SEAL POTP MICO SNST
19920817	57	FRTK TBLS
19920817	58	LEMO
19920818	1	TBLS FRTK
19920818	2	
19920818	3	BOFF BLNT
19920818	4	
19920818	6	OCAR USBK
19920818	7	LBTM LBTC MATT SH06 TMWV VAVM TSMA TSCC MSBH AFTR BAGP TALB LDLS MSBU MSCC ESDG
19920818	8	SEAL LSFL LSFC TPNH TPCC YAWT LTAB UTLD UTCC BRBU SEMA SEMC SEAC BUBD BUBC MLTE
19920818	9	TTIM
19920818	10	BULB TBTS TPLO UWMN MLSC
19920818	51	LHLA SLST
19920818	53	
19920818	54	LDRO
19920818	56	BLND CVLS
19920818	60	LNSE HISC TSMD LDAL TSMC
19920819	2	SQFL SQFY
19920819	3	TSMA TSCC STWT HIS2 STWC UTLD UTLC TPNH TPCC YAWT MTAB MTAC
19920819	4	SCST SCSC HOLO MSMA MSMC
19920819	5	PELW NALS
19920819	6	RP14 FASC TRIP
19920819	7	NODM
19920819	10	
19920819	51	OCAR USBK TMPN

DATE	SIGHT#	DOLPHIN CODES
19920819	52	ETBP TDTN
19920819	53	
19920819	54	LDRO
19920819	55	DBFL TBMP
19920819	56	BTIT DDLG
19920819	58	MWMA MWMC LTVL LTVC
19920820	5	BULM TRIP LGAF HFFN MFLA NDLA LDKB
19920820	6	YAPL
19920820	7	ZIGY TWPF LBTM LBTC NBSB TDLB SOAS
19920820	8	BKTP ESCL
19920820	9	DLSN FASC
19920820	11	TMBL TMBC TPMI TPMC LDTP FMTH MSPN SOTT WBMA WBCC
19920820	52	TMBL TMBC
19920820	53	MSPN BITP MSPC
19920820	56	HLBU
19920820	58	LEHT MSBU MSCC
19920820	59	DIPT FMTH UTLS UTLC FANT
19920820	60	HSLR
19920821	1	BOBN
19920821	2	BFTB YAFT SMHS LSPN LEHT LSPO LLSR BRON LOSC
19920821	4	YAFT UTRS
19920821	5	BUST HLSB
19920821	6	
19920821	8	SMRF
19920821	51	FTSE FMTH FMTC
19920822	51	TPMI TPMC
19920828	52	PRNK BSLC
19920828	53	HSLR
19920828	55	CURL BSLC PRNK

DATE	SIGHT#	DOLPHIN CODES
19930817	104	FHIS FH2C
19930817	106	CURL
19930817	107	SHSP SH2C
19930817	155	CURL
19930817	156	BKBS BKBC
19930818	1	HWCS PRLN
19930818	2	TWPF
19930818	4	
19930818	5	TWSP
19930818	6	TMWV SCST SCSC TMWC HRMN TRLI BELI BFMS BMST DI HW
19930818	7	SCST SCSC HRMN TMWV HOLO MSMA MSMC LDLS TWSP BELL BFMS AFTR MSBU TALB VNKS BXLB HSOC CHKD
19930818	8	PELW
19930818	10	
19930818	11	TFLN
19930818	13	LNSE MSPN LNSC MSPC BITP TSMD BELD ANFO HISC APFA UTRS
19930818	101	MTMS LNDE
19930818	102	FLDM FLDC DJAW RNTR TPLN
19930818	103	DOBS
19930818	104	
19930818	105	
19930818	106	
19930818	108	DBFL TBMP BTIT EDSC OCAR RLBK SCDS FMBB GOFG
19930818	110	TMBL TMBC
19930818	151	FMTH FMTC SHLO SHC2
19930818	152	FTSE
19930818	153	
19930818	154	SHSP SH2C
19930818	155	CURL BKBS BKBC
19930818	156	FANT
19930818	158	
19930818	159	LBLT LBLC
19930818	160	LEMO LEMC
19930818	161	FHIS FH2C
19930818	162	SHSP SH2C
19930818	163	
19930818	164	BULB
19930819	1	
19930819	3	SOLN BXBK TRTP MSMA MSMC
19930819	4	LSLB
19930819	5	
19930819	6	LGSL SCPD SCPC BEAK BE2C LBTM LB2C VCUT CNFL CNFC ODTP TTWS KNBK ENMJ GSDS
19930819	8	NESE BLNT UBPN STBK SBSR CHIP RHNO DLSN
19930819	9	FTSE
19930819	101	RMRL BUBO SBTM BFBT LTLA HSML WAVY

DATE	SIGHT#	DOLPHIN CODES
19930819	102	SADB LASH SNST LDMB SKAD TSMS
19930819	103	BFLA OCAR TBMP RLBK SCDS DBFL SMFT TSLD LTVL LTVC EDSC HLDN
19930819	151	TPLO
19930819	152	
19930819	153	DBNK DBNC
19930819	154	TDLB ZIGY
19930819	155	RY34 SMCO MTSP HAIG
19930819	156	TMBL TMBC
19930819	157	RPPR SHLO SHC2 BSMA BSMC
19930820	1	OPUS
19930820	2	BXLB PACM FMBK ESDG
19930820	3	LATP FTMB
19930820	4	MTMS YALN
19930820	5	WING
19930820	6	MTLA
19930820	7	POTP CRNM GROV BMBK SBMS APLA
19930820	8	CHRG HLBU TMBK BUBD BUBC
19930820	9	YAWT LTAB
19930820	11	SQFL SQFY
19930820	12	SH06 BAGP BAGC CLAU
19930820	13	
19930820	14	
19930820	101	MOUN MOUC DDLG
19930820	103	SBTM
19930820	104	TPNH TPCC UTLD UTLC DLRD
19930820	105	
19930820	151	FMTH FMTC SHLO SHC2
19930820	152	LDTP SOTT BSMA BSMC
19930820	153	BOBN FTSE
19930820	154	TPMI TPMC TMBL TMBC BELD
19930820	156	SMCO TSMA
19930820	157	BLNT NESE SOAS
19930820	158	FLTB LGSL ENMJ ZIGY BEAK BE2C VCUT UDSP RCHS CNFL CNFC GSDS HSWS TSNN VCUC
19930820	159	SBLS
19930820	160	UTLS UTLC
19930820	161	SIMN
19930820	162	LBLT LBLC
19930822	102	YAPL TAGL TAGC TLLA TLLC
19930822	103	LEVM LEVC LSMN BBGH LSBZ
19930823	1	LBTM LBTC NELA PRLN
19930823	3	
19930823	4	TLCM TLCC
19930823	5	FNTP
19930823	6	TAGL TAGC
19930823	7	TPMI

DATE	SIGHT#	DOLPHIN CODES
19930823	101	FMTH BULB FMTC SHLO SHC2 TSCS
19930823	102	TSMD ANFO TBTN TMBL TMBC MTSP MTSC TMDC HISC HICC SMRF PRNK BSMA BSMC
19930823	103	LNSE LN2C BFTB TPLO BTSC BTCC
19930823	105	BXBK SCRH LONS BMST DDLG GROV VOSS
19930823	106	
19930823	107	TSMS LDMB SKAD
19930823	108	TSMD TMDC FMTH FMTC TMBL TMBC SHLO SHC2 BSMA BSMC WBMA WBMC
19930823	151	RPPR
19930823	152	SHSP SH2C FHIS FH2C
19930823	153	LEMO LEMC
19930823	154	
19930823	155	RPPR
19930823	156	MDLB
19930823	157	BPNM BPNC
19930823	158	TMBL TMBC FMTH FMTC
19930824	1	
19930824	11	CLAU NIPE
19930824	101	DBFL TBMP FTPN
19930824	102	NODM BRBU
19930824	103	EDSC FMBB MSMA MSMC RTPM TNSS TTST
19930824	104	LDRO RLBK WIZA BFLA GOFG SKTH NODY BXBK SNST FTNK SCDS LASH TSMS
19930824	152	UTLD UTLC FAFG YAFT
19930824	154	TSMA
19930824	155	HISC HICC TSMD TMDC ANFO UWMN
19930824	157	LDTP SOTT LAHS
19930825	1	BUNB
19930825	2	
19930825	3	CHRG
19930825	4	SBKB
19930825	5	LHLA SLST
19930825	6	PNTP PNTC TRLI FMBK
19930825	101	POTP GROV
19930825	103	
19930825	104	ESDG TLLA TLLC
19930825	151	BSMA BSMC
19930825	152	BSLC PRNK FMTH FMTC
19930825	153	LAHS SIMN
19930825	154	LDTP
19930825	155	
19930825	156	BOBN TPMI TPMC RY34 HWPD
19930825	157	BOBN TSMD TMDC WBMA WBMC
19930825	158	BFTB
19930825	159	LOSC TMWV DJAW SMHS CHKD
19930826	2	FLTB TPLN FLDM FLDC HSML
19930826	151	PTBK

DATE	SIGHT#	DOLPHIN CODES
19930826	152	
19930827	1	MPIN MPIC
19930827	2	RPPR BBUK TSCS
19930827	3	TBTN PTBK
19930827	4	UTLS UTLC
19930827	5	LEMO LEMC
19930827	6	BKBS BKBC

DATE	SIGHT#	DOLPHIN CODES
19940801	3	DIPT CURL RPPR LEMO LEMC TSCS TSIC BULB FHIS FH2C LBLT LBLC SLMS BKBS TPLO BBUK ZENN CVLS PTBK BTSC FANT BLND
19940801	52	RPPR
19940801	53	HSLR TBTN FMTH FMTC
19940801	54	LAHS SIMN
19940802	1	TSMD
19940802	2	TSMD TMDC
19940802	3	BLNT NESE
19940802	5	HIPL
19940802	6	
19940802	7	HIPL
19940802	8	SOLN SCST MSMA MSMC MATT SCSC FLAX SBKB TRLI FMBK LSFM HOLO ESDG OPUS TPLN APFA MTAB YALN HRMN DLHW SH06 JAMS
19940802	9	
19940802	10	UPS2 LDTS
19940802	11	MALC MALD
19940802	12	BFMD VNKS BFMC
19940802	51	CHRG LTAB BRBU
19940802	54	USMS
19940802	56	RTPM HLBU
19940802	57	
19940802	101	BEAK LDKB NDLA
19940802	102	
19940802	103	LSPO
19940802	105	HWPD MTSP UTRS
19940802	106	MSBU MSPN
19940802	107	
19940802	108	DIPT ZENN SLMS
19940803	1	BMBK RFMB PTMS
19940803	2	BBGH
19940803	3	TBNN
19940803	4	DLHW LSFL HRMN TPLN MTAB YALN OPUS SOLN MSMA MSMC SBKB LSFM UBPN FASC TRTP TLCM TLCC SHFL
19940803	52	FTNK
19940803	53	RLBK BMBK GROV SCRH FRTK LDRO SBMS POTP FTNK NTMS ULSM SFPN TMBK FDLB TTST DTLT
19940803	102	HISC HICC HWPD WBMA WBMC UWMN
19940803	104	
19940803	105	SIMN
19940803	106	
19940803	107	
19940803	109	LEMO LEMC
19940803	110	RPPR
19940803	111	LBLT LBLC
19940803	112	
19940803	113	
19940804	1	STIM PRLN
19940804	3	

DATE	SIGHT#	DOLPHIN CODES
19940804	4	HIPF
19940804	7	
19940804	9	TPMI TPMC
19940804	51	MWMA
19940804	52	BMBK DAR2
19940804	53	LTVL
19940804	54	
19940804	55	NTMS SADB TMBK DTLT
19940804	56	LDRO HSRE TMPN
19940804	57	POTP BUBO BXLB SCDS MTLA APLA
19940804	58	VOLT
19940804	59	
19940804	60	
19940804	101	FHIS FH2C
19940804	103	UWMN
19940804	104	HAIG
19940804	105	HAIG SMRF
19940804	106	
19940804	107	WBMA WBMC
19940804	108	WBMA WBMC RORQ HWPD SWAS
19940804	109	LNSE
19940805	1	BBUK MPIN MPIC
19940805	2	LEHT
19940805	4	
19940805	5	WBMA WBMC LOSC BPNM
19940805	7	MTSP SWAS
19940805	8	HAIG MTSP SWAS
19940805	9	LSPO
19940805	10	SMRF
19940805	11	LDTP
19940805	12	TBTN LEMO LEMC BKBS FANT FHIS FH2C
19940805	13	FHIS FH2C
19940805	14	RPPR DIPT HSLR SLMS ZENN
19940805	52	SCDS RLBK LDHN APLA
19940805	53	SCRH SFPN VOSS
19940805	55	
19940805	56	SOAR RTPM HLBU
19940805	57	
19940805	58	SKTH NODY
19940805	59	OCAR OCAC
19940805	60	
19940805	61	
19940805	62	WIZA WIZC LONS LONC
19940805	63	BTIT KBFN GOFG TWSP
19940805	101	SHSP SH2C

DATE	SIGHT#	DOLPHIN CODES
19940805	103	
19940805	104	
19940805	105	TPNH TPCC TRTH SEAL SE2C TNSS BRNB
19940805	106	MTLA BXLB USMV MTMS WING LNDE
19940805	107	CHKD TSMA
19940805	108	CVLS BLND TPLO BBUK BTSC
19940805	109	MPIN MPIC
19940806	51	TPMI TPMC FTSE
19940806	52	TSMD TMDC ANFO BPNM BPNC
19940806	53	YAFT BLND CVLS BITP TPLO LSPO LDAB
19940806	54	RPPR BITP LNSE SHLO SHC2 TSMD TMDC HISC HICC ANFO MSPN
19940808	2	
19940808	3	
19940808	4	CVLS BLND
19940808	5	
19940808	6	
19940808	7	LAHS
19940808	8	BBUK MPIN MPIC
19940808	9	UTLS TSCS BULB SHSP SH2C UTLC TS1C
19940808	51	NODY
19940808	53	
19940808	54	LONS
19940808	55	LDAB PNTP RORQ SLST LHLA ETPL MLSC
19940808	101	BEAK BE2C LGSL SCPD RCHS BELD TTWS ODTP TBMM MSPD
19940808	102	LGSN GSDS
19940808	103	BRON
19940808	104	HWCS STIM PRLN
19940808	105	CHOF ZIGY DLSN CHOL
19940808	107	CLCA LOFL CLCC NOTW LSBZ
19940808	108	SILM
19940808	109	RTLV
19940808	110	BMWL PFLB UDSP
19940808	111	SWAS
19940809	2	BMWL
19940809	3	
19940809	4	LBTM LB2C
19940809	5	HSWS FTMB BAGP LATP HSML
19940809	7	
19940809	8	OPUS TRTP YALN MSMA MSMC FLXL NIBB
19940809	9	
19940809	52	
19940809	53	LSFL LSFC
19940809	54	
19940809	55	
19940809	56	BMWM BMWC

DATE	SIGHT#	DOLPHIN CODES
19940809	57	SEAL SE2C DBNK DBNC BUBD BUBC
19940809	58	TPNH TPCC UTLD UTCC SLST TRTH BRNB
19940809	60	BFLA POTP SCRH SFPN SBMS GROV BMBK VOSS ULSM TOLD TRTR ZAMS HILD
19940809	61	
19940809	101	SHLO SHC2 FHIS FH2C
19940809	102	SHSP SH2C
19940809	111	TRIP WBMA WBMC TMBL TMBC RY34 MFLA LDAL
19940809	112	ETPL ETPC
19940809	113	LEHT
19940809	114	
19940809	115	BSMA BSMC UTLS UTLC
19940809	116	TPMI TPMC UTLS UTLC BSMA BSMC
19940809	117	LAHS SIMN
19940809	118	MPIN MPIC
19940809	119	CURL HSLR BHNL
19940810	2	
19940810	3	TAAS AOSC
19940810	4	TAGL TAGC
19940810	5	LTHL MCBT
19940810	6	HIPF
19940810	7	
19940810	8	NIPE JALW
19940810	9	CLCA CLCC
19940810	10	MLDG
19940810	52	SOAR RLBK EDSC LONS BMWM BMWC BRBU
19940810	53	SFPN FDLB
19940810	101	SHLO SHC2
19940810	102	CURL LEMO LEMC BKBS BKBC
19940810	103	LBLT LBLC
19940810	104	LEMO LEMC RPPR BSMA BSMC BKBS BKBC
19940810	105	SHSP SH2C
19940811	4	LSBZ
19940811	5	
19940811	6	NIPE JALW
19940811	51	LONS POTP
19940811	52	BFLA
19940811	53	WIZA WIZC
19940811	54	WIZA WIZC BITM
19940811	101	SHLO SHC2
19940811	102	BLND CVLS
19940811	103	BBUK BLND CVLS FMTH FMTC
19940811	104	UTLS UTLC
19940811	106	LAHS SIMN
19940811	110	HAIG SMRF SWAS
19940812	101	FMTH FMTC

DATE	SIGHT#	DOLPHIN CODES
19940812	103	SHLO SHC2 TPLO
		CHKD SHFL MAIN

Appendix 5.- Animal Frequency by Year
1990-1994

Dolphin ID	90				91				92				93				94				total
AFTR	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
ANFO	0	0	5	0	0	0	2	0	0	0	0	0	0	0	3	0	0	0	3	0	13
AOSC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
APFA	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	4
APLA	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	2	0	5
BAGC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
BAGP	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	3
BASC	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
BBGH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
BBUK	0	0	2	0	0	0	5	0	0	0	0	0	0	0	1	0	0	0	5	0	13
BE1C	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
BE2C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3
BEAK	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	6
BELC	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
BELD	0	0	0	0	0	0	2	0	0	0	1	0	0	0	2	0	0	0	1	0	6
BELL	0	0	1	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	5
BFBT	0	0	4	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	6
BFLA	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	3	0	7
BFMC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
BFMD	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	4
BFMS	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	3
BFSS	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
BFTB	0	0	3	0	0	0	1	0	0	0	3	0	0	0	2	0	0	0	0	0	9
BHNL	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	5
BITM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
BITP	0	0	6	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	2	0	14
BKBC	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	0	0	0	2	0	7
BKBS	0	0	3	0	0	0	3	0	0	0	0	0	0	0	3	0	0	0	4	0	13
BKTL	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

1990-1994

Dolphin ID	90				91				92				93				94				total
BKTP	0	0	2	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	**5**
BLND	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	6	0	**9**
BLNT	0	0	5	0	0	0	2	0	0	0	2	0	0	0	4	0	0	0	1	0	**14**
BMBK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	5	0	**6**
BMST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	**2**
BMWC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	**2**
BMWL	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	**4**
BMWM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	**2**
BNSC	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
BOBN	0	0	5	0	0	0	1	0	0	0	2	0	0	0	3	0	0	0	0	0	**11**
BOFF	0	0	2	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	**4**
BPNC	0	0	0	0	0	0	1	0	0	0	2	0	0	0	1	0	0	0	1	0	**5**
BPNM	0	0	0	0	0	0	1	0	0	0	2	0	0	0	1	0	0	0	2	0	**6**
BRBU	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	2	0	**4**
BRDO	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
BRLN	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
BRNB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	**2**
BRON	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	**3**
BSLC	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	**3**
BSMA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	3	0	**8**
BSMC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	3	0	**8**
BTCC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	**1**
BTIT	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	**4**
BTSC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	**3**
BUBC	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	**4**
BUBD	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	**4**
BUBO	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	**3**
BUCK	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	**5**
BULB	0	0	7	0	0	0	3	0	0	0	1	0	0	0	2	0	0	0	2	0	**15**

Appendix 5.- Animal Frequency by Year
1990-1994

Dolphin ID	90				91				92				93				94				total
BULM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
BUNB	0	0	2	0	0	0	2	0	0	0	1	0	0	0	1	0	0	0	0	0	6
BUST	0	0	0	0	0	0	2	0	0	0	1	0	0	0	1	0	0	0	1	0	5
BUUD	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	5
BWDG	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
BXBK	0	0	2	0	0	0	1	0	0	0	0	0	0	0	3	0	0	0	0	0	6
BXLB	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	3	0	7
CHIP	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	3
CHKD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	4
CHOF	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	4
CHOL	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2
CHRG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	5
CLAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
CLCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
CLCC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
CLTO	0	0	2	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	4
CLTP	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
CMNK	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
CNFC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
CNFL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3
CNOF	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5
CRES	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	3
CRNM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
CURL	0	0	4	0	0	0	4	0	0	0	2	0	0	0	3	0	0	0	3	0	16
CVLS	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	6	0	9
DAR2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
DARC	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
DASP	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
DBFL	0	0	1	0	0	0	0	0	0	0	2	0	0	0	3	0	0	0	0	0	6

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Dolphin ID	90				91				92				93				94				total
DBNC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
DBNK	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	5
DDLG	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	4
DEVL	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
DIPT	0	0	2	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	3	0	8
DJAW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
DLHW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	3
DLRD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
DLSN	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	1	0	4
DNNK	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2
DOBS	0	0	2	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	5
DTLA	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
DTLT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
EDSC	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	1	0	5
ENMJ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
ESCL	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	6
ESDG	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	1	0	4
ETBP	0	0	3	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	7
ETCC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
ETPC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
ETPL	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	3
ETPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
FAFG	0	0	2	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	4
FANT	0	0	2	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	2	0	7
FASC	0	0	0	0	0	0	1	0	0	0	2	0	0	0	1	0	0	0	1	0	5
FDLB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
FH2C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	5	0	8
FHIC	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
FHIS	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	0	0	0	5	0	10

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Dolphin ID	90				91				92				93				94				total
FLAX	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	4
FLBU	0	0	2	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	5
FLDC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
FLDM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
FLLS	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	4
FLPR	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
FLTB	0	0	2	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	5
FLXL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
FMBB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
FMBK	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	1	0	4
FMTC	0	0	1	0	0	0	3	0	0	0	2	0	0	0	6	0	0	0	3	0	15
FMTH	0	0	3	0	0	0	3	0	0	0	4	0	0	0	6	0	0	0	3	0	19
FNTP	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
FRTK	0	0	1	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	6
FTHS	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
FTLB	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
FTMB	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	3
FTNK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	3
FTPN	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	4
FTSE	0	0	4	0	0	0	1	0	0	0	1	0	0	0	3	0	0	0	1	0	10
GOAT	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
GOFG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3
GROV	0	0	0	0	0	0	2	0	0	0	0	0	0	0	4	0	0	0	3	0	9
GSDS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3
HAIG	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	4	0	7
HFFN	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
HFTP	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
HICC	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	3	0	6
HILD	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2

Appendix 5.- Animal Frequency by Year
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Dolphin ID	90				91				92				93				94				total
HIPF	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	3
HIPL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
HIS2	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
HISC	0	0	5	0	0	0	5	0	0	0	2	0	0	0	3	0	0	0	4	0	19
HISP	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
HLBU	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	2	0	5
HLDN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
HLSB	0	0	2	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	5
HNMI	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
HOLO	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	3
HOSP	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
HRMN	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	5
HSLI	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
HSLR	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	3	0	8
HSML	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3
HSOC	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3
HSPE	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
HSRE	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2
HSWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
HWCS	0	0	6	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	1	0	10
HWPD	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	3	0	7
IALW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
IAMS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
KBFN	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3
KEYL	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
KNBK	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
KNHL	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
LAHS	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	4	0	10
LASH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2

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Dolphin ID	90				91				92				93				94				total
LATP	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	3
LB2C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
LBLC	0	0	0	0	0	0	3	0	0	0	0	0	0	0	2	0	0	0	3	0	8
LBLT	0	0	2	0	0	0	3	0	0	0	0	0	0	0	2	0	0	0	3	0	10
LBTC	0	0	1	0	0	0	1	0	0	0	2	0	0	0	1	0	0	0	0	0	5
LBTM	0	0	1	0	0	0	1	0	0	0	2	0	0	0	2	0	0	0	1	0	7
LCLG	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
LDAB	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	3
LDAL	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2
LDCC	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
LDHN	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3
LDKB	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2
LDLS	0	0	1	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	4
LDMB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
LDMV	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5
LDRO	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0	2	0	6
LDTP	0	0	6	0	0	0	5	0	0	0	2	0	0	0	3	0	0	0	1	0	17
LDTS	0	0	1	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	1	0	5
LEHN	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
LEHT	0	0	3	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	3	0	9
LEMC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	5	0	8
LEMO	0	0	0	0	0	0	1	0	0	0	1	0	0	0	3	0	0	0	5	0	10
LETR	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
LEVC	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	3
LEVM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	3
LGAF	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
LGSL	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	4
LGSN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
LHLA	0	0	0	0	0	0	3	0	0	0	1	0	0	0	1	0	0	0	1	0	6

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Dolphin ID	90				91				92				93				94				total
LLSR	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
LN2C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
LNDE	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	3
LNSC	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	4
LNSE	0	0	3	0	0	0	5	0	0	0	3	0	0	0	3	0	0	0	2	0	16
LOFL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
LOMA	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
LONC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
LONS	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	4	0	7
LOSC	0	0	8	0	0	0	3	0	0	0	2	0	0	0	1	0	0	0	1	0	15
LOSO	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
LOWV	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3
LPSP	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3
LSBZ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	3
LSFC	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	3
LSFL	0	0	1	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	4	0	8
LSFM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
LSHB	0	0	5	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	7
LSLB	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
LSMN	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2
LSPN	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	3
LSPO	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	3	0	6
LTAB	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	4
LTHL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
LTLA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
LTVC	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
LTVL	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	4
MAIN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
MALC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1

Appendix 5.- Animal Frequency by Year
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Dolphin ID	90				91				92				93				94				total
MALD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
MATT	0	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	6
MCBT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
MDLB	0	0	2	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	6
MFLA	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2	0	5
MICO	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3
MIDT	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
MLDG	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2
MLSC	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	5
MLTE	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
MOUC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
MOUN	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	3
MPIC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	4	0	6
MPIN	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	4	0	8
MSBC	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
MSBH	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	4
MSBU	0	0	1	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	1	0	5
MSCC	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
MSMA	0	0	0	0	0	0	1	0	0	0	1	0	0	0	3	0	0	0	3	0	8
MSMC	0	0	0	0	0	0	1	0	0	0	1	0	0	0	3	0	0	0	3	0	8
MSPC	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
MSPD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
MSPN	0	0	1	0	0	0	1	0	0	0	3	0	0	0	1	0	0	0	2	0	8
MTAB	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	4
MTAC	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
MTLA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	3
MTMS	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	1	0	5
MTSC	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2
MTSP	0	0	1	0	0	0	6	0	0	0	1	0	0	0	3	0	0	0	3	0	14

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Dolphin ID	90				91				92				93				94				total
MUNI	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
MWMA	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	1	0	4
MWMC	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3
NALS	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	3
NBSB	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
NDLA	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2
NELA	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3
NELS	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4
NESE	0	0	5	0	0	0	1	0	0	0	1	0	0	0	4	0	0	0	1	0	12
NIBB	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2
NIPE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	3
NODM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
NODY	0	0	2	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	2	0	6
NOTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
NTMS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
NTSB	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
OBLA	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
OCAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
OCAR	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	2	0	6
ODTP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
OPUS	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	6
PACC	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
PACH	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
PACM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	3
PELW	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
PFLB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
PIGN	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3
PKUP	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
PLAT	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2

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Dolphin ID	90				91				92				93				94				total
PMCH	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	4
PMID	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
PNTC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
PNTP	0	0	2	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	5
POT2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
POTP	0	0	2	0	0	0	2	0	0	0	1	0	0	0	3	0	0	0	5	0	13
PRLN	0	0	2	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	2	0	8
PRNK	0	0	0	0	0	0	0	0	0	0	4	0	0	0	2	0	0	0	0	0	6
PRNU	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
PTBK	0	0	3	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	1	0	7
PTCS	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
PTMS	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	3
RCHS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
RFMB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
RHNO	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	4
RLBK	0	0	1	0	0	0	1	0	0	0	0	0	0	0	3	0	0	0	3	0	8
RMRL	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3
RNTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
ROMN	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2
RORQ	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	2	0	5
RP14	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
RPPL	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
RPPR	0	0	5	0	0	0	3	0	0	0	0	0	0	0	5	0	0	0	6	0	19
RTLS	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
RTLV	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2
RTPM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	3
RY34	0	0	4	0	0	0	3	0	0	0	2	0	0	0	3	0	0	0	1	0	13
SADB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
SBBS	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

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Dolphin ID	90				91				92				93				94				total
SBKB	0	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	2	0	7
SBLS	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	3
SBMS	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	3	0	7
SBSR	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
SBTM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
SCDS	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	2	0	6
SCOO	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
SCPC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
SCPD	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	4
SCRH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	5
SCSC	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	1	0	5
SCST	0	0	3	0	0	0	1	0	0	0	2	0	0	0	2	0	0	0	1	0	9
SE2C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
SEAC	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
SEAL	0	0	1	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	3	0	7
SEMA	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2
SEMC	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2
SFPN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
SH06	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	3
SH2C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	8
SHC1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
SHC2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	10
SHDE	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
SHFL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
SHLO	0	0	3	0	0	0	1	0	0	0	2	0	0	0	5	0	0	0	5	0	16
SHSC	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4
SHSP	0	0	3	0	0	0	1	0	0	0	0	0	0	0	4	0	0	0	4	0	12
SHTS	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
SILA	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2

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Dolphin ID	90				91				92				93				94				total
SILM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	2
SIMN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	4	0	7
SKAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
SKTH	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	4
SLIT	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
SLMS	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	3	0	7
SLST	0	0	0	0	0	0	4	0	0	0	1	0	0	0	1	0	0	0	3	0	9
SMCO	0	0	2	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	5
SMFT	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
SMHS	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
SMRF	0	0	2	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0	3	0	9
SNRM	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	5
SNST	0	0	0	0	0	0	2	0	0	0	1	0	0	0	2	0	0	0	0	0	5
SOAR	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	4
SOAS	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
SOLN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	3
SOTT	0	0	6	0	0	0	5	0	0	0	3	0	0	0	2	0	0	0	0	0	16
SPTP	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
SQFC	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
SQFL	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	3
SQFY	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
SQGL	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
SQUA	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
STBK	0	0	1	0	0	0	1	0	0	0	1	0	0	0	2	0	0	0	0	0	5
STIM	0	0	5	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	9
STPN	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
STWC	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
STWT	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
SUBK	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

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Dolphin ID	90				91				92				93				94				total
SWAS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	5	0	6
TAAS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TAGC	0	0	1	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	1	0	6
TAGL	0	0	1	0	0	0	2	0	0	0	1	0	0	0	2	0	0	0	1	0	7
TALB	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
TALK	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	6
TAPR	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TATT	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
TBLS	0	0	1	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	5
TBMM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TBMP	0	0	1	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	5
TBNN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TBTN	0	0	2	0	0	0	4	0	0	0	0	0	0	0	2	0	0	0	2	0	10
TBTS	0	0	4	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	8
TDLB	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
TDTN	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
TFLN	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	4
THUV	0	0	5	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	7
TINW	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TLCC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
TLCM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
TLLA	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	3
TLLC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
TMBC	0	0	0	0	0	0	3	0	0	0	7	0	0	0	6	0	0	0	1	0	17
TMBK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	3
TMBL	0	0	1	0	0	0	3	0	0	0	7	0	0	0	6	0	0	0	1	0	18
TMDC	0	0	0	0	0	0	4	0	0	0	0	0	0	0	4	0	0	0	3	0	11
TMPN	0	0	3	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	6
TMSC	0	0	5	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	7

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Dolphin ID	90				91				92				93				94				total
TMWC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TMWV	0	0	2	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	6
TNLS	0	0	4	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	6
TNSB	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
TNSS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
TOHA	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TOLD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
TPCC	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	3	0	6
TPLN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	4
TPLO	0	0	3	0	0	0	2	0	0	0	2	0	0	0	2	0	0	0	4	0	13
TPMC	0	0	0	0	0	0	3	0	0	0	3	0	0	0	2	0	0	0	3	0	11
TPMI	0	0	1	0	0	0	3	0	0	0	3	0	0	0	3	0	0	0	3	0	13
TPNH	0	0	1	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	3	0	7
TPTS	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
TRIP	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	2	0	5
TRLI	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	1	0	4
TRTH	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	4
TRTP	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	3	0	5
TRTR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
TS1C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
TSC1	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
TSCC	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
TSCS	0	0	2	0	0	0	3	0	0	0	0	0	0	0	2	0	0	0	2	0	9
TSLD	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2
TSMA	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	1	0	6
TSMC	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3
TSMD	0	0	7	0	0	0	4	0	0	0	1	0	0	0	5	0	0	0	4	0	21
TSMS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3
TSNN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1

Appendix 5.- Animal Frequency by Year
1990-1994

Dolphin ID	90				91				92				93				94				total
TTBK	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
TTIM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	3
TTWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
TWPF	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	3
TWSC	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
TWSP	0	0	5	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	9
UBLV	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
UBPN	0	0	2	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	2	0	8
UDSP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
ULSM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
UPS2	0	0	2	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	5
USBK	0	0	1	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	4
USMS	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2
USMV	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3
UTCC	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	3
UTLC	0	0	0	0	0	0	0	0	0	0	2	0	0	0	5	0	0	0	4	0	11
UTLD	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	2	0	6
UTLS	0	0	1	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	4	0	9
UTRS	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	1	0	4
UWMN	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	2	0	5
VAMP	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
VARS	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
VAVM	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
VCUC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
VCUT	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	4
VNAB	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
VNKS	0	0	2	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	5
VOLT	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4

1990-1994

Dolphin ID	90				91				92				93				94				total
VOSS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	3
WAVY	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3
WBCC	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3
WBMA	0	0	1	0	0	0	2	0	0	0	1	0	0	0	2	0	0	0	5	0	11
WBMC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	5	0	7
WHMR	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
WHTP	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
WING	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	5
WIZA	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	3	0	5
WIZC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
YAFT	0	0	2	0	0	0	0	0	0	0	3	0	0	0	2	0	0	0	1	0	8
YALN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	4
YAPL	0	0	0	0	0	0	2	0	0	0	2	0	0	0	1	0	0	0	0	0	5
YAWT	0	0	0	0	0	0	1	0	0	0	2	0	0	0	2	0	0	0	1	0	6
ZAMS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
ZENN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
ZIGY	0	0	5	0	0	0	1	0	0	0	3	0	0	0	2	0	0	0	1	0	12