

MEMORANDUM

TO: Tern Island Files

FROM: Tern Island Staff

SUBJECT: Monthly Activities Report - March 1989

A. HIGHLIGHTS

- FWS flight (Weather Service) arrived and departed with personnel and supplies on 8 March.
- FWS flight (Weather Service) arrived with supplies and departed with weather service personnel on 11 March.
- NOAA Ship Townsend Cromwell delivered personnel and much needed supplies on 25 March.
- Wedge-tailed shearwater adults begin to arrive.
- Golden plovers begin to molt into their breeding plumages.
- First great frigatebird, sooty tern, sooty storm petrel, grey-back tern, and bonin petrel eggs begin to hatch.
- A pair of masked boobies nested (2 eggs) at the southeast end of Tern Island.
- Numbers of adult green turtles at FWS are increasing. Several pairs have been observed copulating; the first recorded copulation was on 23 March.

B. CLIMATIC CONDITIONS

The average daily high temperature was 77.1 degrees F. with a range of 73 to 82. The average daily low was 60.9 degrees F. with a range of 53 to 74. The rainfall total for the month was 4.14 inches, with measurable precipitation occurring on 15 days. The heaviest daily rainfall was 1.21 inches on 3 March. The mean barometric pressure for the month was 1015.9 m.b. with recorded high and low pressures of 1022.6 and 997.5, respectively. There were 15 days in March where cloud cover greater than 90% was recorded.

A storm, which had begun on 17 February, continued through the first three days in March. This extended storm (about 14 days long) caused many birds to abandon their eggs, chicks, or nests and heavy losses occurred. GFB, FWSO, SOTE, GRAT, and WHITE were all greatly affected by this inclement weather. BLNO and SHNO fared better; both albatross species seemed to weather the storm in good shape.

2. ADMINISTRATION

1. FWS Personnel

Darcy Hu and Ken Mithammer were on station throughout March. Darcy is continuing her FWSO studies as well as doing the FWS FWSO fledging success study, FWSO short-term chick growth, GFBH incubation study, as well as writing up the methods for the banding and short-term chick growth studies taking place on Tern Island. She is also organizing the island wide sea-bird and shorebird counts and participated in most of them. In addition to all of the above, she still finds time to assist on Tern Island Maintenance projects such as the re-pairing and scraping of the gas sheds. Dick Bauer arrived on 25 March and was quickly pressed into service.

2. FWS Volunteers

David Kuwahara continued his work with Darcy on the FWSO studies. He also is doing the FWS fledging success and incubation length studies. In addition to his biological studies, David is helping with a wide variety of maintenance projects such as repairing and scraping the gas sheds and re-painting and repairing our tricycles.

Jennifer Megyesi, our valued long-term volunteer, departed Tern Island on the 8 March flight. Her energy, love of birds, interest in all aspects of Tern Island operation, and willingness to take on all types of jobs and responsibilities has been missed since her departure. Her energy and outgoingness often diffused into other Tern Island personnel revitalizing them. I was going to list the jobs and projects Jennifer was involved in, but I do not think we have enough paper to list them all. So I was going to list only the things she was not involved in to save time and paper! However, I could not think of anything she was not involved in. This shows how important she was to our operation at Tern Island!! Mahalo Jennifer!!

Vanessa Gauger arrived on the 8 March flight. She quickly picked up where she had left off last summer continuing her BLNO masters project as well as the FWS BLNO studies and assisting on other biological and operational projects.

3. NMFS Personnel/Volunteers

Mitch Craig (NMFS) and Laura Gill (Vol) arrived via the Cromwell on 25 March. They were quickly put to work unloading the Cromwell. They met the HNF's whaler operational and began their seal work the following week.

4. Arrivals and Departures

08 March - FWS flight. Arriving were Vanessa Gauger (FWS vol/grad stud), Bob Uchida and Dave Nardini (Weather Service), and pilots (Bob Justman and John Fosson). Departing were Jennifer Megyesi (FWS vol) and pilots.

11 March - FWS/Weather Service flight. Arriving were pilots (Bob Justman and Terry Cockett) and supplies. Departing were Bob Uchida, Dave Nardini and pilots.

25 March - NOAA ship Townsend Cromwell. Arriving were Dick Bauer (FWS), Mitch Cris (BMFS), Laura Gill (NMFS vol), and codes of supplies and materials. Departing were recyclable copper and aluminum and empty propane, nitrogen, acetylene, and oxygen tanks.

5. Safety/Accidents and Illnesses

There were no serious accidents or illnesses on Tern Island during March. All standard safety procedures for plane and vessel arrivals were followed. To reduce the possibility of bird-strike at the west end of the runway, vegetation was cleared along the north-west and south-west ends of the runway. In the process of clearing these areas, 75 SOTS eggs were destroyed. In the future, runway maintenance will be extended to include these newly cleared areas.

The mooring, Tern Island channel, and reef-gap channel buoys were all replaced this month. The two channel buoys were replaced with new, red, 3 foot-high buoys to increase their visibility.

7. Logistical and Technical Support

Tuesday morning radio checks with the Honolulu Coast Guard Communications Station were continued as usual at 0715 hrs. Contact was instantly made three of the four Tuesdays. No contact was established on 14 March and efforts were given up about 0830 hrs.

Contact with the USFWS Honolulu office continues M, W, and F at 0730 hrs.

The Laysan Island field camp radio contact was changed to 1900 hrs M, W, and F instead of 2000 hrs. The first radio contact with Laysan was on 26 March to check the radio out. Normal scheduled call began at 1900 hrs on 29 March.

A message was relayed from Honolulu Com Sta (Coast Guard) to the fishing vessel E. T. Com Sta wanted to know E.T.'s ETA at Honolulu so they could be contacted about their collision with a freighter at Brook's Bank on 27 February.

8. Meals

During March, a total of 373 meals were served to FWS personnel, volunteers, and guests. An additional 38 meals were served to NMFS personnel from their stores.

Permanent Tern Island Staff

Name	Number of Meals
K. Niethammer	93
D. Hu	93
Total	186

Volunteers/Non Tern Island Staff/Guests

Name	Number of Meals
D. Kawabara	93
V. Gauger	71
D. Bauer	19
Pilots	4
Total	187

F. HABITAT

Our battle against sandbars (*Cenchrus echinatus*) continues. In addition to pulling sprouts from the area already cleared we have spot sprayed (using Roundup herbicide) sandbar plants in the heavily infested area between the gas pad and K. HMO colony. After knocking the sandbars back with herbicide we will try to eradicate the remaining sprouts by hand.

Darcy and David have initiated a campaign against another exotic member of the family Compositae. They have begun pulling plants in several areas.

Wire, netting and other hazardous debris are continuously collected from Tern and the other islands.

6. WILDLIFE

1. Endangered and Threatened Species

a. Hawaiian Monk Seal

FWS personnel continued seal censuses on Tern Island each Thursday at 1300 hrs. NMFS personnel assumed the responsibility for these counts upon their arrival. Two dead seals were found on Waialeale Island during the last week in March. One of these seals was an adult the other was tagged (P 57). NMFS personnel were also greeted by a seal fatality (Shark inflicted wounds) on Tern Island (another tagged seal P 82). The first weaned pup of the year was tagged. During March, only one pup was tagged.

b. Green Turtle

Around the middle of the month, adult turtles were constantly sighted in the waters around Tern Island. It seemed as if turtle activity was increasing dramatically. During the last half of the month, several pairs were observed copulating; the earliest (2 pairs) on 23 March. During the last week of March, a check of East and Waialeale Islands found 5 and 30 backers at each of the islands, respectively. Most of these backing turtles were male; only 8 to 10 females were noted.

Last year the first turtle copulations were recorded during the first week of April and the first nests were laid the last week of April. This year's activity might indicate another "early" turtle season.

2. Seabirds

A few black-footed and Laysan albatross chicks had flank feathers appearing by the end of the month, but most were still downy. They have not started wandering far from their nests yet. No major die-offs of chicks have been recorded.

The red-tailed tropic bird fledging success study begun in February continued this month. In addition, an incubation length study began on 4 March. The accumulation of incubation study nests began slowly, but picked up during the last nine days of the month, during which time 40 new nests were added to the study. Of the 60 total incubation study eggs marked by the end of the month, 14 have already failed. The island census conducted on 5 March resulted in a count of 71 eggs.

At mid-month, another red-footed booby egg laying peak was observed. This second peak probably results from relays of the nests lost during the late February storms. As this relaying progressed, we banded the first local chicks of the year. As of month's end, none had yet fledged.

A masked booby pair nested at the south-eastern corner of Tern Island in the D sector of the booby study area. Two eggs had been laid by month's end.

The first great frigatebird egg hatched on 14 March. The incubation length study being conducted has revealed a very high nest failure rate. Eggs were still being laid at month's end.

Many black noddys laid second clutches this month, after successfully fledging a chick. A few chicks have hatched from these second clutches already. At month's end, BLNOS seemed to be in the midst of their second nest building and egg laying peak.

Brown noddys have been continuously laying eggs. Many of these eggs are relays resulting from the heavy frigatebird predation on chicks. As with BLNOS, BRNOS could be found at all stages of the nesting cycle this month, from eggs to fledged chicks.

The first Bonin petrel eggs hatched around the 15 March. By month's end, the wedge-tailed shearwaters were reclaiming their burrows destroying BOPF eggs and chicks. Both BOPF chicks being observed were killed by WSHs. Hopefully, there are still some live BOPF chicks left out there; but none are known.

No Bulwer petrels had been sighted by month's end.

Christmas shearwaters adults were present throughout the first two or three weeks then they seemed to disappear during the last few days of March. Perhaps they, like WSHs, have a pre egg-laying exodus. No eggs had been laid by the end of the month.

The first wedge-tailed shearwater adult was observed 1 March. Numbers of adults quickly increased and they began vocalizing and excavating burrows by 8 March, soon to the chagrin of the BOPFs.

Sooty storm petrel eggs and chicks were observed on East Island during the month. On 30 March, a dead BOPF chick was found; this was possibly another victim of WSH predation.

The first grey-backed tern egg hatched on 23 March. They have been making a comeback since the late February storm, during which almost all eggs were lost. By 24 March, the nesting census resulted in a count of 151 eggs and 2 chicks.

The first sooty tern egg hatched 15 March. They also suffered greatly from the late February storm. They have continued to lay eggs in several locations including south of the generator building and redwood tanks, around the tennis court and on three sides of the barracks building.

White terns also suffered during the February storm. That is surprising in that some of them made it through the storm. The first of the WHITE study chicks began fledging. Egg laying was steady throughout March. Between 50 and 60 nesting pairs have been identified in the WHITE study area, more than expected.

3. Other Birds

Three shorebird counts were conducted in March:

Species	Census Dates		
	3/4/89	3/17/89	3/31/89
Buddy Turnstone	526	449	423
L. Golden Plover	29	31	46
Sanderling	5	3	5
M. Tattler	2	0	0
Western Sandpiper	2	1	3
Bristle Thighed Curlew	12	9	6

Golden plovers were acquiring their breeding plumages this month. Some were almost completely moulted by month's end, others were just beginning their moult.

"Accidental" bird sightings included: the male pintail duck that arrived in February, lesser frigatebird, and possibly a black-bellied plover (identification was not for certain).

4. Banding

The following numbers of birds were banded at Tern Island during March:

Species	Locals	Adults
WHITE	7	13
BLMO	30	0
RFBO	12	6*
LAAL		1*

* Of these bands 5 RFBO and 1 LAAL replaced existing bands.

Totals 49 20

Grand Total...69

J. EQUIPMENT AND FACILITIES

5. Systems

a. Water

Rainfall continued to keep all three redwood tanks full throughout the month. The freshwater pressure pump still appears to be running more often than it should. It seems that the pressure is back-feeding through the pump's jet. However, when a new jet was installed it did not help.

The saltwater reduced tank has sprung a couple of minor leaks. These should be easily stopped using the clay we have recently received. The saltwater pipe feeding our aquarium broke one night resulting in us losing several thousand gallons of saltwater. This break was easily repaired the next morning when it was discovered.

b. Power

The continued low level of stored power in our photovoltaic batteries was becoming very troublesome!! Bob Union (Weather Service) said that they had had trouble with the type of battery we are using. He said that low recharging currents combined with the fact that the batteries are stationary (fluids inside do not get moved around much) allows a corrosive coat to form on the battery's plates causing the battery to build up resistance which reduces the amount of electricity that is available to be used. He suggested two methods of breaking up this corrosive layers using short-term and average charging currents or physically shaking the batteries to spread the fluids around inside the batteries. We did not have the capability to supercharge the battery so David, Davey, and I took the battery units apart and tried to shake them up as best as

we could. Each unit weighs between 250 and 300 lb. so it was not easy. We then re-assemble the unit reversing the order they were connected in. This treatment seemed to work, we recovered a lot of storage capacity. The questions are: How long will it take to go bad again? How much did we gain? Are we back to the batteries original storage capacity or are did we just reduce some of the resistance that had built up? Presently, the battery level remains in the operational zone. Back-up generators have not been needed to charge the photovoltaic battery since we shook it up.

Two of the three digital multimeters used to monitor the photovoltaic system are acting up and need to be replaced.

All diesel and gasoline generators are working well.

C. Radios

Static from the DC fluorescent lights continues to interfere with all HF radio communication. The Laysan radio checks were rescheduled for 1900 hrs in order to get around radio noise after dark.

The VHF relay station is finally on-line at East Island. The relay station works fine; however, initial checks showed that anything blocking the "TAD" radios transmission to East Island presents a problem. Whenever using the "TADs" you must be facing East Island with no major objects between the "TAD" and East Island. We have not tested the relay station from Gins or Disappearing Islands yet.

6. FUEL RESERVES

The following fuels were on hand as of 1 April, 1984:

Diesel Fuel	1800 gal
Propane	5 large bottles
	6 field camp bottles
Gasoline (FWS)	220 gal (4 drums)
Aviation Gasoline	110 gal (2 drums "new")
Aviation Gasoline	55 gal (1 drum "old")
Gasoline (MPS)	440 gal (8 drums)

During March the FWS received large and small bottles of propane and one 55 gallon drum of aviation fuel. MPS received 4 1/2 drums (55 gallon) gasoline. One of the old aviation drums sprang a leak, that gasoline has been transferred to another drum and will be used to burn netting and etc. Another drum of old aviation gasoline is now being used in our outboard.

Report prepared by: A. Nishimura

MEMORANDUM

TO: Tern Island Files

FROM: Tern Island Staff

SUBJECT: Monthly Activities Report - April 1989

A. HIGHLIGHTS

- A live monk seal pup was born on Tern Island.
- The first turtle nested on Tern on 29 April.
- Christmas shearwaters began laying.
- Bulwers petrels arrived.
- The Smithsonian seal camp began on East Island.

B. CLIMATIC CONDITIONS

The month began with a 6 day stretch of 20-knot winds, from the 4th through the 9th. There were 6 more such days spread out during the remainder of the month.

The average daily high temperature was 76 degrees F. with a range of 72 to 81. The average daily low was 67.4 degrees F. with a range of 63 to 71. The rainfall total for the month was 1.055 inches, with measurable precipitation occurring on 9 days. The heaviest daily rainfall was 0.65 inches on 24 April. The mean barometric pressure for the month was 1019.5 m.b. with recorded high and low pressures of 1022.0 and 1017.4, respectively. There were 17 days in April where cloud cover greater than 50% was recorded.

C. ADMINISTRATION

1. FWS Personnel

Dick Bauer and Darcy Hu were on station throughout April. Ken Niebauer was on Tern through 19 April, when he left to attend Refuge Academy. Craig Howland arrived on the 19 April flight and stayed the remainder of the month.

Dick is tending to and documenting the Tern Island water system. He performed scheduled maintenance on the tractor and generators, and is our primary boat mechanic. In addition, he has taken over the Gray-backed tern incubation study, finished up the first set of GRFS incubation length nests, and participates in or performs most avian censuses on the island.

While on Tern, Ken was busy getting equipment and studies into shape in anticipation of his departure, and briefing those staff members remaining on Tern on upcoming tasks. He hopefully found time to put together his Refuge Academy slide show.

Craig came up to Tern to assist in operations while Ken N. was at Refuge Academy. Craig conducted a property inventory, helped set up the East Island camp, started the Tern Island portion of the turtle study and assisted in various maintenance and biological tasks.

Darcy continued the FWS' red-footed booby success study and her own work on this species. She marked a second set of GRFS nests from which to obtain incubation lengths, since many in the first set of nests failed.

2. FWS Volunteers

Vanessa Gauger spent the month working diligently on her Master's research on black noddies, much of it entailing hours of behavioral observations. She is also conducting the FWS' reproductive success study on this species. During Ken's absence, Vanessa is carrying on the WERE study.

David Kuwahara continues as primary worker on the ETRH incubation length and reproductive success studies. He assists with HRO work, and also took over the Christmas shearwater incubation length study from Ken. In addition to his biological studies, David is caring for orphaned birds and renovating the gas sheds.

3. NMFS Personnel/Volunteers

Mitch Craig (NMFS) and Laura Gill (Vol) continued their monk seal work, primarily censuses and patrols on Tern and atoll-wide. They transported camp equipment and supplies to East Island, and helped set up the Smithsonian/turtle camp.

Laura also is interested in thiazi avian, and helps with the shorebird counts, black naddy observations, booby work, and has responsibility for crown naddy banding.

4. Arrivals and Departures

19 April - FWS flight. Craig Howland arrived, and Ken Niebauer departed. Pilots were Bob Justman and John Posson.

25-30 April - Smithsonian flight. Arrivals were John Francis and Damon Job, Smithsonian researchers, and Stewart Feder. Stewart and an anonymous, undrained female monk seal pup departed. Pilots were Bob Justman and Terry Cockett.

5. Safety/Accidents and Illnesses

There were no serious accidents or illnesses on Tern Island during April. However, Laura Gill developed a very sore neck, a condition she has had occasionally before. The Honolulu FWS office contacted Dr. Nakasone, and he gave permission to take a muscle relaxant. Laura recovered fully within a few days.

A new radio policy was instigated for visits to Disappearing Island. The whaler calls both before and after someone is let off or picked up from the island. This way if something does go wrong, people on Tern will know within 15-20 minutes that assistance is needed.

All standard safety procedures for plane arrivals were followed. Clearing the vegetation and terns from the west end of the runway (see March Activity Report) appears to have eliminated the sooty tern problem during aircraft approach. No birds were struck during landings or takeoffs.

7. Logistical and Technical Support

Tuesday morning radio checks with the Honolulu Coast Guard Communications Station continued as usual at approximately 0715 hrs. We made contact each time.

Contact with the USFWS Honolulu office continues M, W, and F at 0730 hrs.

The Laysan Island field camp radio contact continues at 1900 hrs M, W, and F. Communications generally have been good.

The East Island camp calls every morning and evening at 8:00.

8. Meals

During April, a total of 461 meals were served to FWS personnel, volunteers, and guests. An additional 180 meals were served to NMFS personnel from their stores.

Permanent Tern Island Staff

Name	Number of Meals
K. Niehammer	58
D. Hu	90
Total	144

Volunteers/Mon Tern Island Staff/Guests

Name	Number of Meals
D. Kuvahara	90
V. Gauger	90
D. Bauer	90
C. Rowland	35
S. Fefer	4
Pilots	8
Total	317

F. HABITAT

The island is quickly browning in the dryness and heat.

Cenchrus echinatus eradication continues: Ken spot sprayed a final time before departing Tern, and we have continued spot pulling wherever we encounter seedling plants. Possibly because of reduced rain, there does not seem to be much resprouting in the sprayed areas.

Wire, netting and other hazardous debris are continuously collected from Tern and the other islands.

G. WILDLIFE

1. Endangered and Threatened Species

a. Hawaiian Monk Seal

Mitch and Laura conducted 2 atoll surveys in April. They documented 24 pups in the atoll: 14 on East, 4 on Whaleskate, 1 each on Little Gin and Gin, 1 on Tris, 3 on Tern and 5 on Round. They tagged 3 weanlings and retagged 6 older seals. They recorded 11 fresh injuries, from a swollen eye to a massive gash into the muscle layer.

Six seals were known to have died in April: 1 still born pup on Tern, 3 pups who died soon after birth (1 on Tern and 2 on East), and 2 juveniles. Causes of death are not known. In addition, they found 6 seals dead on various islands in the atoll who had obviously died before April.

On April, a badly injured female (shark bite) gave birth to a live pup near the telephone pole top on the south shore. This is the first recorded live birth for Tern Island. We never saw her nurse the pup, which died the following day. The female remained at the spot for several more days, and then left. She was resighted on Tern later in the month, looking much healed.

On 20 April, a live pup was born to a female near the t-bar bush on the south shore of Tern Island. This is first successful live birth recorded for the island. The pup was alive at month's end, although it seems to be growing slowly.

Mitch spotted an undersized, veaned, female pup on East Island on 28 April. An adult female who had lost her pup seemed to accept it later that day. However, on the 30th, the pup was again alone. She was captured and flown back to Honolulu on the returning Smithsonian flight.

Smithsonian workers John and Dason began their research on mother-pup vocalizations and pup switching. Mitch and Craig gave them an introduction to East Island on the 29th. Mitch then remained on East with them for several days to further help with their set-up.

Two seals were disentangled from debris during April. One was a weanling with a piece of copper wire that was easily removed from its neck without restraint. The second involved an adult male on Tern Island with a fiber packaging band around its midsection. This band was tight and beginning to cut into its skin; when removed, it was obvious that the band had cut into the seal's ventral, although only minimally. This band was removed using a gaff--when stretched, the band broke easily. No restraint was needed, or even possible due to its size.

b. Green Turtle

MMFS personnel reported possible nest pits on Whaleskate on April 16 and saw a large number of baskers. On the 28th, we found the first signs of turtle wanderings on Tern, and found the first nest the following morning. We then began morning walks to locate and stake nest pits made the preceding night.

2. Seabirds

Albatross chicks were feathering out in April, and have begun to scoot and walk. We noted no major chick die-offs.

Addition of more nests to the red-tailed tropic bird incubation length study continued daily until April 11th, when 75 nests had been marked. But due to nest failures, additional nests were added later in the month. At month's end, 45 nests remained active out of the 82 nests marked. Eggs began hatching in the study area, as well as in other areas of the island. Five incubation study nests hatched. The April 17 island census results were: 410 eggs, 44 chicks for a total of 454 nests.

Red-footed continued laying and relaying at a low, although

sustained, level. The first chick fledged on 1 April. On 13 April, a pair whose chick had fledged approximately 2 weeks earlier laid a new egg. If successful, they will fledge 2 chicks this year.

The first egg of the single masked booby nest on Tern hatched on the 27th. However, that chick was dead on the 29th. The pair continued to incubate their remaining egg through the end of the month.

Frigate chicks from the earliest successful nests were large enough to remain unbanded during the day, although they usually were guarded by a parent. Laying appears to continue. However, displaying males are less in evidence.

Black noddies reached a second annual peak in egg laying this month. This peak was about half the size of the first peak, which occurred in November and December of 1988. Nest failures recently seem to be primarily due to frigate and boobies roosting in the BLMO colonies, or stealing nest material. Thirty local birds and one adult were banded in April and an incubation length study was mostly finished.

Brown noddy nesting continues, with the April 13th count yielding 844 eggs and 540 chicks. All stages, from eggs to fledged chicks were represented in appreciable numbers.

Aside from airborne adults in the evenings, no Bonin petrels were seen during the month. Hopefully, there are yet a few chicks still around.

Bulwer petrels were first seen on the 14th at the gas pad, although they probably arrived several days before, judging from evidence of digging at old nest sites. They were heard throughout the month calling at night at the pad. No eggs yet.

Christmas shearwaters began laying on approximately 5 April, when we found the first 3 eggs. By the end of the month, we found 19 nests, mostly under heliotrope on the south shore, typically in sites facing the water.

Wedge-tailed shearwaters continue to vocalize and excavate burrows. Many pairs or groups are found on the island throughout the day. As many as 50 birds have been seen together on the runway in front of the refuge sign. It does not appear that they have had a pre-laying exodus yet.

We continued to find evidence of sooty storm petrels on East Island. Mitch saw several chicks in an albatross burrow, and Dick found a dead chick, which he froze.

Grey-backed terns continued egg laying. End of the month count showed 103 nests on the island; 153 of these had eggs and 10 had chicks. One chick was banded. The first phase

of the incubation study was complete by month's end. Of approximately 100 nests marked along the west end and a short portion of the north side, 35 chicks hatched and it appears that 0 to 2 at the most will fledge. Lay dates were obtained for 42 additional nests.

Sooty terns continued laying in several spots on Tern: in the body colony area and just west of the pad, and east of the tide gauge and among frigate bushes on the north side. The eggs laid around the barracks began hatching this month, and provide all with an intimate view (plus sound effects) of sooty domestic life.

White tern egg count for April showed the highest number of eggs yet this year. The ongoing incubation length and nest check study has shown that there is still a high failure rate, especially for eggs. Six adults and three local birds were banded.

3. Other Birds

Two shorebird counts were conducted in April:

Species	Census Dates
Ruddy Turnstone	4/14/89 4/28/89
L. Golden Plover	461 371
Sanderling	45 50
W. Tattler	1 2
Western Sandpiper	2 3
Bristle Thighed Curlew	9 6

The only incidental bird sighting this month was of two adult male lesser frigates. One of these brought nest material to an adult female great frigate sitting on a nest platform, landing on her back to do so. However, the following day, that nest site was occupied by an adult male great frigatebird.

4. Banding

The following numbers of birds were banded at Tern Island during April:

Species	Locals	Adults
WHITE	3	6
BLMO	30	1
BRMO	115	0
HFBO	99	1
GBTE	1	0
Totals	248	8

Grand Total... 256

J. EQUIPMENT AND FACILITIES

5. Systems

a. Water

At months end approximately 32,000 gallons of fresh water are in storage in the three redwood tanks.

b. Power

Since shaking up the solar batteries in March, voltages have remained in the 24.1-24.4V range in the mornings. We have not had to use the backup generator at all. We have probably been helped by somewhat clearer skies this month, ensuring complete recharge every day.

All diesel and gasoline generators are working well.

c. Radios

Static from the DC fluorescent lights continues to interfere with all HF radio communication. The Laysan radio checks were rescheduled for 1900 hrs in order to get around radio calls after dark.

The VHF relay station on East Island is working well. We have had good communication from the Gina and Disappearing.

6. FUEL RESERVES (NUMBERS NEED UPDATING)

The following fuels were on hand as of 1 April, 1989:

Diesel Fuel	7 gal
Propane	5 large bottles
Gasoline (FWS)	6 field camp bottles
Aviation Gasoline	220 gal (4 drums)
Aviation Gasoline	110 gal (2 drums "new")
Gasoline (MWS)	55 gal (1 drum "old")
	440 gal (8 drums)

Report prepared by: DB, DR, CR with help from NC, VG, LG, DK.