

2000 Technical Report #1

## **Wildlife and Vegetation Surveys**

*In the*

## **Tinian Proposed Conservation Area**

Performed  
By

**CNMI Division of Fish and Wildlife  
Wildlife Section**

And

**Tinian Department of Lands and Natural Resources  
Fish and Wildlife and Conservation Sections**



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## SUMMARY OF WILDLIFE AND VEGETATION SURVEYS

### TINIAN PROPOSED CONSERVATION AREA

*FEBRUARY 15-19, 2000*

Performed by:

CNMI Division of Fish and Wildlife  
Wildlife Section  
P.O. Box 10007  
Lower Base, Saipan 96950

and

Tinian Department of Lands and Natural Resources  
Fish and Wildlife and Conservation Sections  
Box 178  
San Jose, Tinian 96952

#### ***Executive Summary***

In an effort to help establish a proposed Conservation Area on Tinian, biological assessments were made of the region between Rion Point and Suicide Cliff from 15-19 February, 2000. Surveys of forest birds, vegetation, reptiles, fruit bats, and coconut crabs were performed jointly by the CNMI-Division of Fish and Wildlife and the Tinian Department of Lands and Natural Resources.

We found that much of the vegetation in this area was composed of limestone forest and included many very large examples of native trees. Nearly 500 birds of 10 species were counted in this forest. Bridled white-eyes were extremely numerous, but the Tinian monarch was scarcer than we had hoped to find. Numbers of birds were similar to those found on similarly sized Aguiguan with the exception of the Rufous fantail, which was twice as numerous on Aguiguan. Only one Megapode was heard during our stay on Tinian, and this was near Mt. Lasso and not in the proposed Conservation Area. We observed no fruit bats during three nightly counts. Coconut crabs seemed relatively numerous, but because the data was only collected for one night, it does not support any conclusions. One monitor lizard as well as one shrew, and an introduced species, the Curious Skink, were caught on the adhesive traps laid out for them.

## ***Introduction***

In order to benefit the species native to the CNMI and some that are unique to Tinian, the CNMI Division of Fish and Wildlife, in conjunction with the Tinian Department of Lands and Natural Resources, conducted a biological assessment of the area between Suicide Cliff and Rion Point (Fig. D1). This approximately 700 ha area was proposed to the legislature of the CNMI as a Wildlife Conservation Area by the second senatorial district delegation (S.L.B. #11-2) in 1998. The region provides habitat for many species of birds, coconut crabs, and reptiles in particular and is also extremely diverse floristically. The proposed Conservation Area would benefit the people of Tinian by not only conserving flora, fauna, and an aquifer for current and future residents, but it would also boost the local economy by providing an impetus for eco-tourism.

Unfortunately, the above proposed legislation beneficial to both the people of Tinian and the wildlife of the island, was vetoed by the Governor in 1999. This was partly due to lack of a biological assessment of the area, and to the short duration (5 years) of the proposed Conservation Area. The surveys performed on 15-19 February 2000 should provide better information to decision makers so that they can assess the biological foundation for declaring the Conservation Area should this issue arise in the future. It is our hope that the Mayor of Tinian and the representatives to the legislature from the island will consider submitting their request again, armed with the appropriate biological data, but requesting the Conservation Area be declared for a much longer period of time. From our perspective, such a declaration should endure for at least 50 years in order to better assure survival of the species.

Personnel conducting the surveys first met with the DLNR Resident Director Mr. Norman Manglona, and Officer in Charge Mr. Henry Cabrera. They were then divided into two survey teams to complete bird and vegetation surveys: Vicente Camacho, Joshua Muña, Joe Gonzalez (Saipan DFW), and Henry King (Tinian DLNR) on one team; Nathan Johnson (Rota DFW), Richard Lazaro (Tinian DFW), Elvin Masga, and Joe San Nicholas (Tinian DLNR) on the second team.

## ***Forest Bird Survey***

Forest bird surveys were conducted in the mornings from 6:00 a.m. to 11:00 a.m. on 16-18 February. Bird observers, in teams of two, performed point counts every 150 m along six transects. One person recorded data while the other performed the count. Most birds were counted by their song or call notes rather than by sight. The transects were set systematically to sample different habitats present within the site (Fig. D2) and were composed of 6 to 8 count stations.

Transect 1 ran through native limestone forest (see descriptions of forest types below under Vegetation Survey), mixed secondary forest, tangantangan, and

open fields. Transect 2 ran through strictly mixed secondary forest while transects 3, 4 and 5 were in predominantly limestone forest. Transect 6 ran through limestone forest and mixed secondary forest.

In all, 495 forest birds were counted along these 6 transects, or about 11.5 birds per station. Bridled white-eyes (*Zosterops conspicillatus*) were by far the most common bird (Table D1). Rufous fantails (*Rhipidura fufifrons*), Micronesian starlings (*Apolis opaca*), Fairy terns (*Gygis alba*), Mariana fruit-doves (*Ptilinopus roseicapilla*), Tinian monarchs (*Monarcha takatsukasae*), and Collared kingfishers (*Halcyon chloris*) were plentiful. Micronesian honeyeaters (*Myzomela rubrata*), Philippine turtle-doves (*Streptopelia bitorquata*), and White-throated ground-doves (*Gallicolumba xanthonura*) were uncommon. One Micronesian megapode (*Megapodius laperouse*) was also counted but this was well outside of the proposed Conservation Area. No Guam swiftlets (*Collocalia bartschii*), Nightingale reed-warblers (*Acrocephalus luscini*), or Golden white-eyes (*Cleptornis marchei*) were observed. Transect 2 in mixed secondary forest appeared to have a great diversity of birds as well as the greatest abundance. A bird conspicuously absent from this transect was the Micronesian honeyeater.

Table D1. Summary of forest birds counted at 43 stations on in the proposed Tinian Conservation Area, 16-18 February, 2000. Habitat types: <sup>a</sup> = native limestone forest; <sup>b</sup> = mixed secondary forest; <sup>c</sup> = tangantangan; <sup>d</sup> = field/shrub.

Bird Species	Number of birds per station on each transect						Total	Birds/ station
	1 a,b,c,d	2 <sup>b</sup>	3 <sup>a</sup>	4 <sup>a</sup>	5 <sup>a</sup>	6 <sup>a,b</sup>		
Bridled white-eye	4.38	10.9	4.13	8.83	4.29	6.50	277	6.44
Micronesian starling	0.50	0.38	0	2.17	2.0	1.83	45	1.05
Rufous fantail	1.38	1.38	0.25	0	0.71	1.50	42	0.98
Fairy tern	1.0	3.13	0	0.17	0.14	0.33	37	0.86
Mariana fruit-dove	0.13	1.50	1.00	1.33	0.43	0.50	35	0.81
Tinian monarch	0	1.38	0.88	0.50	0.43	0.33	26	0.60
Collared kingfisher	0.88	0.75	0.25	0.50	0.14	0.50	22	0.51
Micronesian honeyeater	0.13	0	0.25	0.17	0.29	0.17	7	0.16
Philippine turtle-dove	0	0	0	0.17	0	0	1	0.02
White-throated ground-dove	0	0.13	0	0	0	0.17	2	0.05

With the exception of Bridled white-eyes, the numbers of birds detected during this survey on Tinian were too few to give a robust estimate of the population size using the Variable Circular Plot analytical program DISTANCE. However, when combined with the Aguiguan survey performed just one month later,



estimates for several species could be made (Table D2). The area surveyed on Tinian (approximately 700 ha) is very nearly the same size as Aguiguan Island (718 ha) so a comparison is of interest.

Table D2. Comparison of the numbers of birds detected per station along survey transects on Tinian and on Aguiguan. Population estimates were calculated using the DISTANCE statistical package, stratifying the two surveys. The numbers in brackets ( ) below the population estimate give the 95% Confidence Interval.

Bird Species	Birds/Station Tinian, February 2000	Birds/Station Aguiguan, April 2000	Tinian VCP Population Estimate	Aguiguan VCP Population Estimate
Bridled white-eye	6.44	3.44	14,338 (10,002-20,554)	10,582 (8,047-13,916)
Micronesian starling	1.05	1.17	1,749 (1,271-2,407)	3,162 (2,276-4,391)
Rufous fantail	0.98	2.38	3,834 (2,474-5,942)	7,877 (6,042-10,269)
Fairy tern	0.86	0.67	--	--
Mariana fruit-dove	0.81	1.21	208 (152-283)	287 (225-366)
Tinian monarch	0.60	--	--	--
Collared kingfisher	0.51	0.67	255 (131-495)	350 (208-588)
Micronesian honeyeater	0.16	1.97	1,603 (668-3,844)	4,009 (3,011-5,339)
Philippine turtle-dove	0.02	0.50	--	--
White-throated ground-dove	0.05	0.25	--	--

Bridled white-eyes, Mariana fruit doves and Collared kingfishers in the proposed Tinian Conservation Area were very similar in density to those on Aguiguan. Micronesian starlings and Micronesian honeyeaters may possibly have been more numerous on Aguiguan than in the same sized area on Tinian. However, the upper confidence limit for the Tinian population overlaps considerably with the lower limit for the Aguiguan population, so whether or not they are truly populations of different sizes is not clear. However, there are clearly far more Rufous fantails on Aguiguan than in a similar sized area on Tinian.

## Vegetation Survey

Vegetation was described using point-quarter methodology performed immediately after early morning bird counts at 43 point stations along 6 transects in the proposed Conservation Area. The % canopy cover, % ground cover, and location from a Geographic Positioning Device were recorded at the center of the bird count station. Then the area within a 50 m radius was divided into quarters by imaginary lines to the N, S, E, and W. For each quarter the circumference at breast height and distance to the nearest tree greater than head height was measured. These trees were identified to species.

A total of 23 tree and shrub species were identified during the survey. There were 20 native species that occur in the Marianas naturally, and 3 introduced species (*Leucaena*, *Carica*, and *Lantana*). Eleven of the native species are endemic and occur only in the Mariana Islands. One shrub/small tree species, *Canthium odoratum* var. *tinianense* was named for Tinian as it was first identified there.

Almost 60% of the habitat sampled (Fig. 3) was native limestone forest (species included *Neisosperma oppositifolia*, *Aglaiia mariannensis*, *Cynometra ramiflora*, *Guamia mariannae*, *Drypetes dolichocarpa*, *Ficus tinctoria*, *Erythrina variegata*, *Pisonia grandis*, and *Ochrosia mariannensis*). A little over 35% was mixed secondary forest (species found included *Pandanus* sp., *Hybiscus* sp., *Cerbera dilatata*, *Carica papaya*, and *Casuarina equisetifolia*). *Cerbera dilatata* is generally a limestone forest species, which indicates it may have been spared some earlier disturbance and a more recent forest has grown up around it. *Cerbera dilatata* and *Drypetes dolichocarpa* are both native endemic species, which are rare and more limited in distribution and population than other native species such as *Ochrosia*, *Guamia* and *Cynometra*. Tangantangan (*Leucaena leucocephala*) and field/shrubs made up 5% each of the sample area.

The native wildlife food species identified within the forest include *Aglaiia mariannensis*, *Cerbera dilatata*, *Discocalyx megacarpa*, *Drypetes dolichocarpa*, *Erythrina variegata* var. *orientalis*, *Eugenia palumbis*, *Ficus prolixa*, *Ficus tinctoria*, *Grewia crenata*, *Guamia marianne*, *Hibiscus tiliaceus*, *Neisosperma oppositifolia*, *Ochrosia mariannensis*, *Pandanus* sp. and *Psychotria mariana*.

Overall, *Ochrosia* was the most frequently encountered tree species (Fig. 4) followed by *Guamia*, *Aglaiia*, and *Cynometra*. Each of these species was represented in over 20% of the vegetation quarters and are typical of native limestone forest. *Leucaena*, *Pandanus*, *Pisonia*, and *Psychotria mariana* were represented in 10-15% of the vegetation quarters.

Figure D3. Proportion of habitat types found along 6 transects in the proposed Tinian Conservation Area.

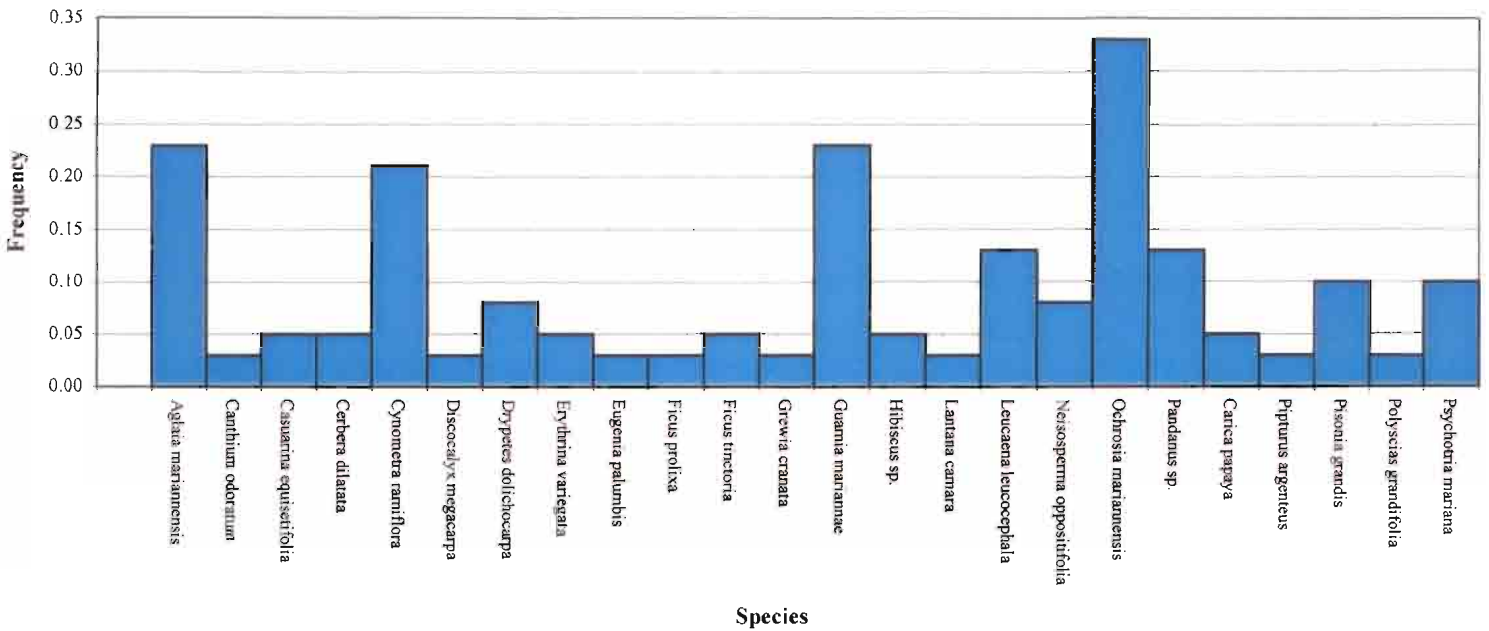
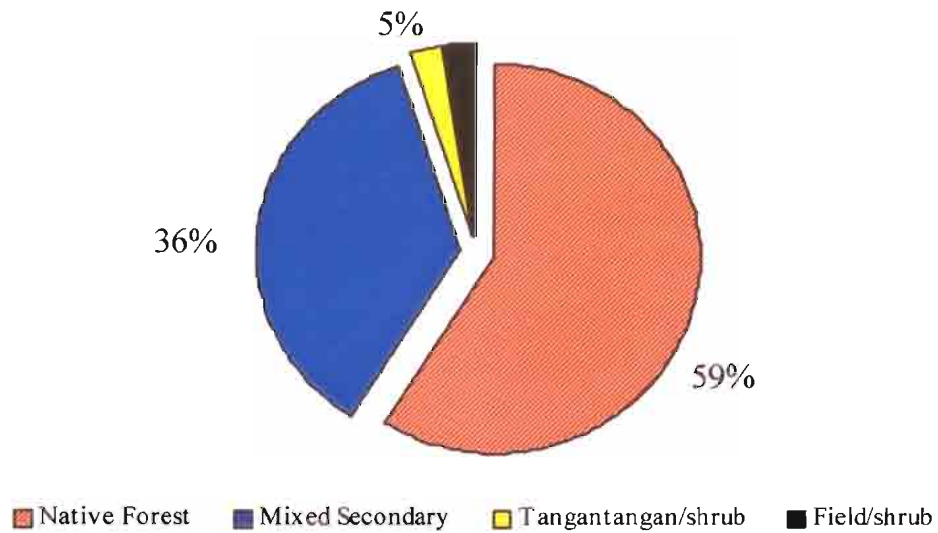


Figure D4. The frequency of tree species found along 6 transects at 43 stations within the proposed Tinian Conservation Area.



### ***Coconut Crab Survey***

Joe Gonzalez (BTS program) and Elvin Masga (Tinian DLNR) completed the coconut crab survey. The survey was not as extensive as originally planned. As planned, several nights of work are necessary to capture, mark and release the crabs so that a population estimate can be obtained. Because access to the survey area could not be obtained from a private land owner on schedule, only one night of trapping was conducted. Therefore, no estimate of population size could be calculated.

The coconut crab survey was performed along transect #5 on 18 February. Crabs were attracted to baits composed of grated and fermented coconut set during the day. Baits were checked for crabs between 8:30 and 10:00 p.m. and 6 crabs were captured. Crabs were marked, measured, weighed, and then released on site. Data on crabs is given in Table 3.

Table D3. Coconut crab data from a single night of trapping in the proposed Tinian Conservation Area.

Individual	Sex	Mass (g)	Carapace Length (mm)	Carapace Width (mm)
1	F	380	82.14	79.05
2	M	390	82.99	81.08
3	M	700	98.64	90.22
4	M	195	64.74	58.87
5	M	499	98.47	89.59
6	F	210	64.17	62.96

### ***Mariana Fruit Bat Survey***

Counts for fruit bats were conducted at dusk on the 15<sup>th</sup>, 16<sup>th</sup>, and 18<sup>th</sup> of February and attempted on the 17<sup>th</sup>. Inclement weather prohibited the fruit bat counts planned for that evening. The counts began in the late afternoon at approximately 5 p.m. and terminated at approximately 7:15 p.m. or full dark. Fruit bat counts were conducted at Suicide Cliff and Mt. Lasso (see dusk stations marked on Fig. D2), around the harbor, and behind the Tinian Dynasty. No Mariana Fruit Bats were encountered during the survey period.

### ***Herpetological Survey***

Sticky traps to assess the herpetological fauna of the proposed Conservation Area were set out on Feb. 16<sup>th</sup> and 19<sup>th</sup>. On each of two transects (Fig. D2), 25 sticky traps were set from early morning until mid-afternoon. The only skink captured was *Carlia fusca*, an introduced reptile commonly called the Curious



Skink (Table D4). Overall the capture rate was 7.28 skinks per trap hour. The capture rate for the skinks we found in the proposed Conservation Area (6 to 8 animals trapped per trap-hour) is comparable to the rate of captures for similar surveys on Saipan.

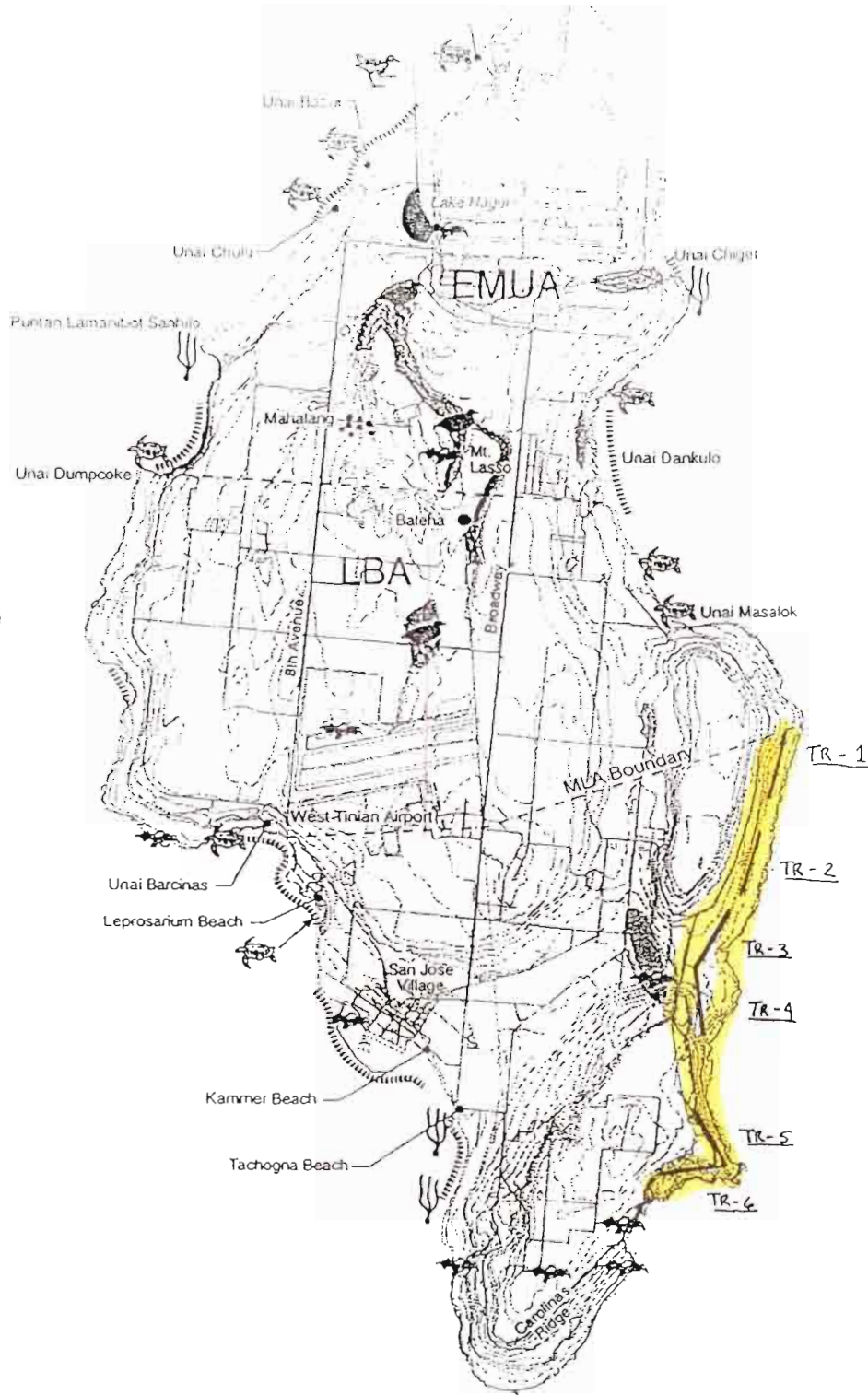
Table D4. Captures of *Carlia fusca* in 99 traps set on four transects in the proposed Tinian Conservation Area, February 2000.

Date	Transect	Forest Type	Total Time (hr)	Number Captured	Number/Trap Hour
2/16/00	1	Limestone	8.08	60	7.43
2/16/00	2	Mixed Secondary	7.17	59	8.23
2/19/00	5	Limestone	5.83	41	7.03
2/19/00	6	Mixed Secondary	7.08	45	6.36

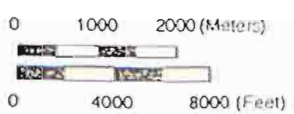
One monitor lizard (*Varanus indicus*) 117 mm long and 22 g in mass and one shrew (*Sincus marinus*) were also captured in the traps. After capture, all skinks and the monitor lizard were weighed and measured (Table 5).

Table D5. Average measures of *Carlia fusca* in the proposed Tinian Conservation Area in February 2000.

Date	Transect	Average Snout-vent Length (mm)	Average mass (g)
2/16/00	1	48.1	2.4
2/16/00	2	49.2	2.2
2/19/00	5	47.2	2.1
2/19/00	6	47.1	2.3
Mean ± SD		48.0 ± 5.55	2.2 ± 0.59

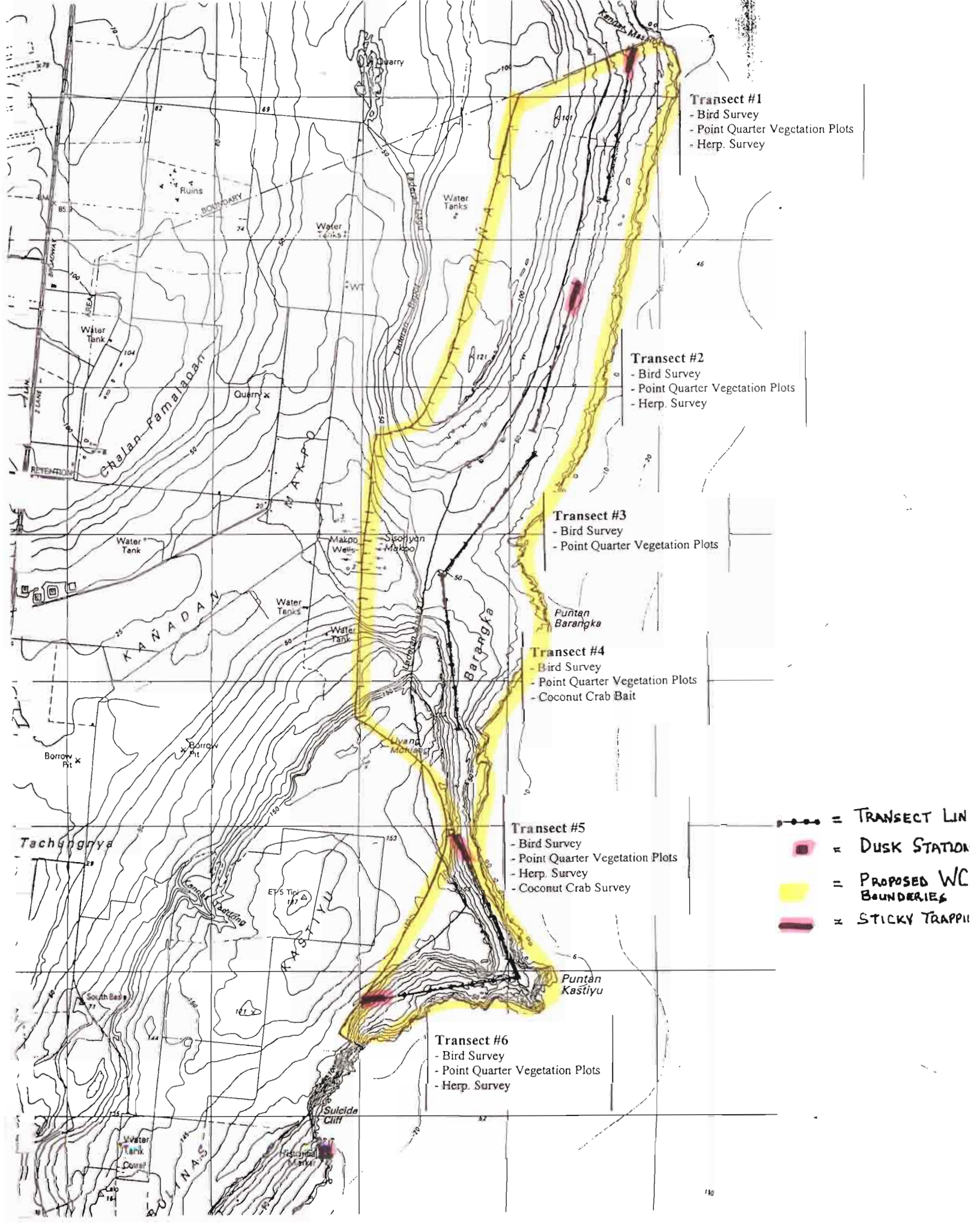


NORTH



TINIAN FIELD TRIP, FEBRUARY 2000







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