

## **Assessment of Exploitation Level and Population Status of the Sulawesi Forest Turtle (*Leucocephalon yuwonoi* McCord, Iverson and Boeadi, 1995) in the Northern Part of Central Sulawesi, Indonesia**

### **Penetapan Tingkat Eksploitasi dan Status Populasi Kura-kura Hutan Sulawesi (*Leucocephalon yuwonoi* McCord, Iverson and Boeadi, 1995) di Kawasan Sulawesi Tengah Bagian Utara, Indonesia**

**Awal Riyanto**

Zoology Division, Research Centre for Biology, The Indonesian Institute of Sciences.  
Jl. Raya Jakarta Bogor Km.46, Cibinong 16911, Indonesia  
E-mail: awal@biolipi.bogor.net and awank\_herp@yahoo.com

#### **Abstrak**

Kura-kura Sulawesi (*Leucocephalon yuwonoi* McCord, Iverson and Boeadi, 1995) adalah satu dari sekian banyak kura-kura yang paling sedikit diketahui dan paling jarang di dunia. Pada tahun 1995 yaitu tahun pertama ditemukan, kura-kura ini telah membanjiri restoran di daratan utama Cina, dan oleh IUCN-The World Conservation Union populasi kura-kura ini dikategorikan kritis. Penelitian ini untuk mengungkap tingkat eksploitasi dan status kura-kura Sulawesi yang dilakukan di kawasan utara Sulawesi Tengah dari tanggal 28 April sampai 13 Mei 2002. Penelitian dilakukan dengan dua pendekatan yaitu (1) survei menggunakan garis transek pada habitat yang merupakan kawasan anak sungai dan (2) kunjungan kepada para pemburu atau kolektor untuk mendata jumlah kura-kura yang ditangkap. Hasil penelitian ini menunjukkan bahwa tingkat eksploitasi kura-kura Sulawesi pada tahun 2002 diperkirakan mencapai 720 ekor dan status populasinya dinyatakan langka dengan frekuensi 1,91 per hari. Hasil penelitian berhasil pula mengungkapkan lokasi baru pada penyebaran kura-kura Sulawesi.

Kata kunci: kura-kura Sulawesi, tingkat eksploitasi, status populasi

Diterima: 12 April 2003, disetujui: 29 September 2003

#### **Introduction**

There are about 260 extant species of turtle in the world and 39 among them are found in Indonesia (Iskandar, 2000) and 18 of these are exported in life from this country (Yuwono, 1998). In the last ten years, the demand of turtles from Indonesia has been increasing, especially from China, European countries, and United State (Suwelo, 1999; Iskandar, 2000).

The Sulawesi forest turtle (*Leucocephalon yuwonoi* McCord, Iverson and Boeadi, 1995) is one of rare species, first described by McCord *et al.* (1995) and confined to small area on the Minahasa

peninsula of Sulawesi, Indonesia. Within a year of its discovery, this turtle was started to be shown at food markets in mainland of China. This species, which does not thrive in capacity, may well become extinct not much later than its discovery (Lovich *et al.*, 2001). Its population is classified as critically endangered in the current IUCN-the World Conservation Union threat categories (Colijn, 2000).

The aim of this research is to assess the exploitation level and population status of *L. yuwonoi* (McCord, Iverson and Boeadi, 1995), in the northern part of Central Sulawesi.

## Study Area and Methods

The survey was conducted between 28 April to 13 May 2002 in the northern part of Central Sulawesi province. Population data were gathered by two approaches: (1) direct observation along transect lines set on small draining rivers after hunters collecting turtles and (2) visiting hunters to examine their collections.

Study for the area first approach were: (1) desa (village) Karya Agung, kecamatan (subdistrict) Mountong, kabupaten (district) Parigi-Mountong (0°31'5.34"N; 121°02'6.93"E; elevation 69 m); (2) Labonu village, Dondo subdistrict, Toli-Toli district (0°40'2.18"N; 120°39'4"E; elevation 174 m); (3) Bangkir village, Dampal Selatan (Damsel) subdistrict, Toli-Toli district (0°15'8.27"N; 120°39'4.07"E; elevation 25 m); (4) Tibo village, Sindue subdistrict, Donggala district (0°29'5.03"S; 119°47'5.19"E; elevation 96 m); and (5) Toaya village, Sindue subdistrict, Donggala district (0°35'7.54"S; 119°48'8.23"E; elevation 48 m) (Figure 1).

Data obtained by the second approach included the total number of hunters, the number of turtles caught per subdistrict per unit period, and carapace length, carapace width and weight of each turtle captured.

Density of the turtles observed in each survey was classified into six categories following Buden (2000), i.e. common (at least 30 sightings/day in suitable habitat and under optimal weather conditions); fairly common (10-29 sightings/day); uncommon (5-9 sightings/day on most days); scarce (up to 4 sightings/day, but possibly none for more than half the days); Hyp (hypothetical or doubtful); and V (vagrant or accidental, including unestablished introduction).

## Results and Discussion

### Exploitation Levels

The total number of hunters in the five subdistricts surveyed was six persons (Table 1). All these hunters mainly worked in cacao farms and collecting turtles during their free time as an additional income. In each

subdistrict, the average number of hunters were range: 1-2 and the average number of turtles caught was 26.40 (132/5), with the average collecting time being 2.2 months (range: 1.5 - 4). The mean number of turtles caught per person was 12.00 (26.40/2.2) a month. Based on these results, the total number of turtles captured this year from the northern part of Central Sulawesi was estimated to be 720 (12 x 12 x 5).

Since *L. yuwonoi* (McCord, Iverson and Boeadi, 1995) has alimited distribution and preference of ecah spelialized habitats such as small draining rivers near secondary forest, and small canals which is draining in the cacao farms area. These types of habitats are currently diminishing with a disturbance from the human activity, it seems that *L. yuwonoi* is already endangered..

A synthesis of this report data, type data from McCord *et al.* (1995) and supported by anatomical study, it can be concluded that all the samples collected with the exceptions of population were in reproductive stadium.

### Population Status

With respect to the population density, Bangkir population is the highest, probably due to preserved habitat from little use of herbicide in cacao plantation, and the absence of collecting effort for a year. Tibo was the second rank followed by Toaya, Labonu, and Karya Agung subsequently (Table 2). The low population density in Labonu and Karya Agung may affect from intensive collecting activity and anthropogenic disturbance of the habitat condition, probably due to the easy access from Palu City. The disturbance of habitat in Labonu and Karya agung by herbicide used in the farms and by logging activity.

The total length of transect in four subdistricts was 10.50 km and the total number of turtles caught were 21 (Table 2). As a consequence, the overall density of the turtle was about two turtles per km and the average number of the turtle caught per day was 1.91 (21/11). Following Buden (2000), therefore, population status of the turtle in region was classified as *scarce*.

All of the survey sites of this study are new locality records for *L. yuwonoi* (McCord, Iverson and Boeadi, 1995), because the species was known from the type locality in northern Sulawesi near Gorontalo (0°33'N; 123°05'E) and near Poso (1°23'S; 120°45'E) (McCord *et al.*, 1995).

## Conclutions

- (1) The total number of *Leucocephalon yuwonoi* (McCord, Iverson and Boeadi, 1995) captured in the northern part of Central Sulawesi in this year was estimated to be as large as 720.
- (2) Collecting of *L. yuwonoi* (McCord, Iverson and Boeadi, 1995) by hunters in Central Sulawesi were in the reproductive stage except on Palu, this situation is very dangerous for their population.
- (3) All survey site for the population study in this research were new localities for *L. yuwonoi* (McCord, Iverson and Boeadi, 1995).
- (4) The population status of *L. yuwonoi* (McCord, Iverson and Boeadi, 1995) was classified as *scarce*, with overall frequency being 1.91 per day on the transect set.

## Acknowledgments

I would like to thank Mr. George Saputra who have participated in finance support, Mr. Budiyanto Tasman (Terraria) and Mr. Fuddin Taula (Losari Depot, Palu) for their technical assistance ang guidance on the field. Mrs. Nuramaliati Prijono and Mrs. Mumpuni Sancoyo (MZB) for the administrative assistance. Special thank also go to Mr. Hidetoshi Ota (University of the Ryukyu, Japan) for his editorial comments.

## References

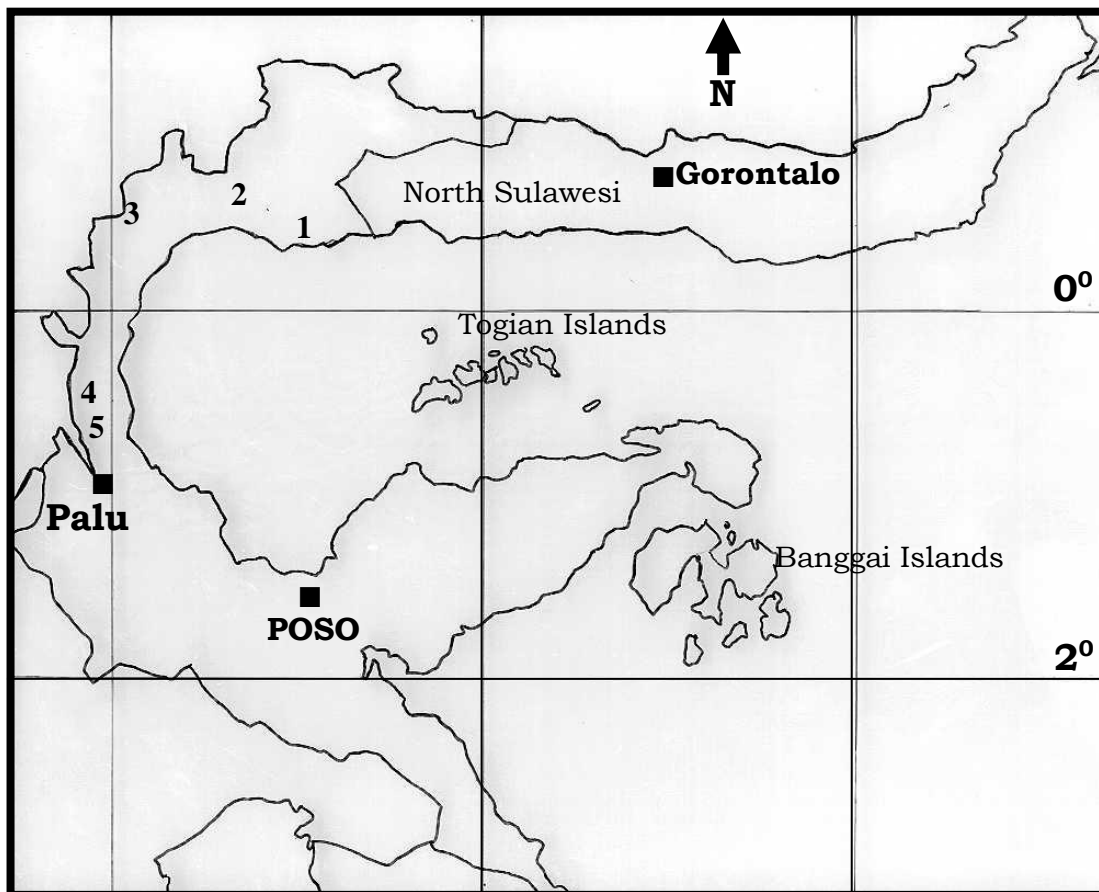
- Buden, D.W. 2000. The Reptiles of Pohnpei, Federated State of Micronesia. *Micronesia* 32 (2): 155 – 180.
- Colijn, E. 2001. *IUCN Reptile Red List Indonesia*. <http://www.nature-conservation.or.id>. 20 April..
- Iskandar. D.T. 2000. The Indonesian and Papua Turtles and Crocodiles (With notes about species in South East Asia). Bandung: ITB Press, 211 pp.
- Lovich, J.E., Mittermeier, R.A., Pritchard, P.C.H., Rhodin, A.G.J. and J. W. Gibbons. 2000. Powdermill Conference: Trouble for the World's Turtles. *Turtle and Tortoise Newsletter*. 1:16-17.
- McCord, W.P., Iverson, J.B., and Boeadi. 1995. A New Bataguridae Turtle from Northern Sulawesi, Indonesia. *Chelonian Conservation and Biology*. 1(4): 311-316.
- Suwelo. I.S. 1999. *Turtle Export*. National Proceiding Conservation of Amfibia and Reptilia Biodiversity on Indonesia. Relationship PAU Biological Science Bogor Institute of Agriculture & Research Centre for Biology-The Indonesian Institute of Sciences. 4 November. Bogor.
- Yuwono. F.B. 1998. The Trade of Live Animals in Indonesia. In Erdelen. W. (Ed). Conservation, Trade and Sustainable Use of Lizards and Snakes in Indonesia. *Mertensiella* 9: 9-15. Germany: Rheinbach.

**Table 1.** The total number and biological data of *Leucocephalon yuwonoi* captured by hunters in the five subdistrict of the northern part of Central Sulawesi.

Subdistrict and District	Duration of Collecting effort (month)	No. of collectors	Turtles caught	No. of mature individuals (males/females)	Carapace (cm)		Weight (kg)
					Length	Width	
Dondo, Toli-Toli	1.5	1	19	13 (5/8)	17.19±5.11 (N=13)	13.99±4.05 (N=13)	1.26±0.39 (N=13)
Palu, Donggala	4	1	96	35 (14/21)	19.48±4.68 (N=35)	15.8±2.41 (N=35)	1.35±0.56 (N=35)
Mountong, Parimo	1,5	1	5	5 (3/2)	21.90±2.13 (N=5)	16.70±0.97 (N=5)	1.50±0.42 (N=5)
Sindue, Donggala	2	2	9	9 (4/5)	21.88±1.94 (N=9)	16.77±0.93 (N=9)	1.57±0.36 (N=9)
Damsel, Toli-Toli	2	1	18	18 (9/9)	21.92±2.40 (N=18)	17.14±1.83 (N=18)	1.59±0.35 (N=18)
<b>Total</b>	<b>11</b>	<b>6</b>	<b>132</b>				

**Table 2.** The length of transects and the numbers of turtles captured in the five subdistricts in the northern part of Central Sulawesi.

Villages. Subdistrict	Transect lenght (km)	Number of turtles caught	Density (indiv./km)	Catching Effort (days)
Karya Agung. Mountong	3	1	0.33	3
Labonu. Dondo	2	1	0.50	3
Bangkir. Damsel	2.5	11	4.80	3
Tibo. Sindue	2	6	3	1
Toaya. Sindue	1	1	1	1
<b>Total</b>	<b>10.50</b>	<b>21</b>		<b>11</b>



**Figure 1.** Locations of the localities surveyed in the northern part of Central Sulawesi Province. 1. Karya Agung; 2. Labonu; 3. Bangkir; 4. Tibo; 5. Toaya.

