

CEDI - P. I. B.
DATA 31 12 / 87
COD. E1D00119

THE THREAT OF DEVELOPMENT TO INDIGENOUS PEOPLES
IN THE BRAZILIAN AMAZON

Philip M. Fearnside
Department of Ecology
National Institute for Research in
the Amazon (INPA)
C.F. 478
69.000 Manaus-Amazonas
BRAZIL

Office: (092) 236-9304
Res.: (092) 236-2652

April 27, 1985
Revised: June 8, 1985

SUMMARY:

THE THREAT OF DEVELOPMENT TO INDIGENOUS PEOPLES IN THE BRAZILIAN
AMAZON

Amerindians in the Brazilian Amazon are threatened by development. An even greater threat than rapid deforestation is the pattern of retraction of previous governmental commitments to reserves. In the Grande Carajás Program area, existing or planned highways bisect 14 reserves. In Rondônia, site of the POLONOROESTE regional development project, planned roads cut 6 reserves.

Impediments to protection of indigenous populations include a tendency of urban Brazilians to view Amerindians as a part of the country's history -- a "problem" which, while viewed sympathetically, is already in the past. The elimination of tribal peoples and cultures is still in progress today and can be expected to continue, unless policy changes are made. In rural areas of the Amazonian interior near tribal lands attitudes are strongly hostile to indigenous peoples, a fact not often realized by persons whose lives are confined to urban settings. Antipathy to Amerindians among the rural Luso-Brazilians with whom they compete most directly for land and other resources makes the continued integrity of remaining tribal lands doubtful without a strong governmental commitment to defending these areas. The inviolability of Amerindian lands is guaranteed by Brazil's constitution. Since enforcing the constitution is the responsibility of the Brazilian government, the best prospect for

Abstract: P. 2

indigenous peoples gaining protection is through government measures to protect their constitutional and human rights.

RESUMO:

A AMEAÇA DO DESENVOLVIMENTO AOS POVOS INDIGENAS DA AMAZONIA
BRASILEIRA

os índios da Amazônia brasileira se encontram ameaçados pelo desenvolvimento. Uma ameaça ainda maior que o desmatamento rápido é a tendência a revogar compromissos prévios do governo à proteção de reservas. Na área do Programa Grande Carajás, rodovias existentes ou planejadas cortam 14 reservas. Em Rondônia, local do projeto de desenvolvimento regional POLONOROESTE, estradas planejadas cortam 6 reservas.

Impedimentos à proteção de populações indígenas incluem a visão, de muitos brasileiros que vivem em meios urbanos, dos índios como uma parte da história do país, ou seja um "problema" que, embora visto com simpatia, já faz parte do passado. A eliminação de povos e culturas tribais está ainda ocorrendo hoje, e continuará se não houver mudanças urgentes de política. Em áreas rurais do interior da Amazônia perto de terras indígenas, as atitudes são bastante hostis aos índios, um fato muitas vezes não apreciado por pessoas cujas vidas são restritas ao ambiente urbano. A antipatia aos índios entre os Luso-brasileiros rurais com quem eles competem mais diretamente para terra e outros recursos, faz com que a integridade continuada das terras indígenas remanescentes seja duvidosa sem um compromisso forte do governo para defender estas áreas. Sendo que o cumprimento da constituição cabe ao governo brasileiro, a inviolabilidade das

terras indígenas é garantida na constituição brasileira. A melhor perspectiva para os povos indígenas obterem proteção é através de medidas governamentais para proteger os direitos constitucionais e humanos destas pessoas.

RESUMEN:

 LA AMENANZA DEL DESARROLLO A LOS PUEBLOS INDIGENAS DE LA AMAZONIA
 BRASILEÑA

Los indios de la Amazonia brasileña se encuentran amenazados por el desarrollo. Una amenaza aún mayor que la rápida derrumbada de bosques es la tendencia de revocar compromisos previos del gobierno a la protección de reservas. En la área del Programa Grande Carajás, carreteras existentes o planeadas cortan 14 reservas. En Rondônia, local del proyecto de desarrollo regional POLONOROESTE, caminos planeados cortan 6 reservas.

Impedimentos a la protección de poblaciones indígenas incluyen la visión, de muchos brasileños que viven en medios urbanos, de los indios como una parte de la historia del país, o sea un "problema" que, mientras visto con simpatía, ya hace parte del pasado. La eliminación de pueblos y culturas tribales está ocurriendo todavía hoy, y continuará caso no hayan cambios de política. En las áreas rurales del interior de la Amazonia cerca a las tierras indígenas, las actitudes son bastante hostiles a los indios, un hecho muchas veces poco apreciado por personas cuyas vidas son restrictas al ambiente urbano. La antipatía a los indios entre los Luso-brasileños rurales con quien ellos compiten más directamente por la tierra y otros recursos, hace con que la integridad continuada de las tierras indígenas remanescientes sea dudosa sin un compromiso fuerte del gobierno para defender estas áreas. La inviolabilidad de las tierras indígenas es garantizada

en la constitución brasileña. Siendo que la enfuerzamiento de la constitución es la responsabilidad del gobierno brasileño, la mejor perspectiva para que los pueblos indigenas consigan obtener proteccion es através de medidas gubernamentales para proteger los derechos constitucionales y humanos de estas personas.

DEFORESTATION AND RETRACTION OF COMMITMENTS TO PROTECTED AREAS

One of the serious threats to the survival of Amerindian peoples and cultures in the Brazilian Amazon is the deforestation of the region. Indigenous peoples, whose entire lives are intimately connected with intact natural ecosystems, might find survival impossible if deprived of this resource base. The powerful array of interrelated forces driving deforestation (Fearnside, 1982, nd-a) makes habitat destruction a likely cause for extinction of many tribal cultures in the coming decades.

In the long run the tendency to renege on previous commitments to protected areas of forest, including Amerindian reserves, is probably an even greater threat to the survival of these cultures than is the current rapid pace of deforestation. If no reserve is safe from being expropriated for development purposes whenever conflicts of interest arise, sooner or later this can only lead to the elimination of both the forest and the tribes. It is precisely this pattern of retraction of commitments to protected areas that one observes in Amazonia today. For example, in the 800,000 km² area of the Grande Carajás regional development program, no fewer than 14 Amerindian areas and reserves are crisscrossed by existing or planned highways (Fig. 1 and Table 1: Reserves 3,4,5,7,10,11,13,14,15,20,21,25,29 and 31). Seven of these reserves are to be cut by more than one highway (Reserves 5,7,10,14,15,20 and 25). The worst is the Mãe-Maria Reserve (Reserve 10), already cut by two existing highways, one railway and one (not shown) high tension

power transmission line right-of-way (not shown). In addition to cutting reserves by highways, power lines and a railway, some of the reserves in the Grande Carajás Program zone shown in Figure 1 have also been reduced in area. Two reserves were partially flooded by the Tucuruí Reservoir in 1984 (Reserves 6 and 32), and one of these (the Paracanã Reserve: number 6) was further reduced to make way for the new routing of the Transamazon Highway (BR-230) necessitated by the reservoir flooding. Along the Carajás-São Luis railway line, two reserves (numbers 18 and 21) have reportedly been reduced in size to make way for the railway. The Xikrin tribe (not shown in Fig. 1), located in the general area of the PA-279 Highway (Conselho Indigenista Missionário, 1982), has reportedly lost the southern portion of its reserve in order to make way for that recently completed road (M. Schmink, personal communication, 1985).

Another part of the Brazilian Amazon where a special regional development program is accelerating development is Rondônia, a state near the Bolivian border. Together with Mato Grosso, Rondônia is the focus of the POLONOROESTE Project, financed by the World Bank (Interamerican Bank for Reconstruction and Development, 1981). Deforestation in this area is explosive (Fearnside, nd-b; Fearnside and Salati, 1985), and a planned network highways makes a farce of forest protection efforts (Fearnside and Ferreira, 1984). Areas opened by highways are quickly invaded by settlers. Maps published by the government of Rondônia show planned highways passing through reserves (Brazil, DER-RO, 1982; Brazil, CODARON, 1983) (Fig. 2). Six Amerindian reserves are cut (Reserves 2,4,7,11,15 and 17). One of these six is cut twice (Reserve 4). In addition to Amerindian reserve

violations, one biological reserve (Reserve 3) is cut by one and a second (Reserve 12) by three different highways.

ATTITUDINAL BARRIERS TO PROTECTING INDIGENOUS PEOPLES

1.) THE MYTH OF AMERINDIANS AS HISTORY:

Public perceptions are a key factor in determining whether or not the Brazilian government takes effective action to protect Amerindians and their lands. One of the most persistent barriers to taking the matter of Amerindian protection seriously is the tendency to dismiss the entire issue as one of history -- a long and sad story but one that is already over. Most of Brazil's tribal population has, in fact, already disappeared -- either by death or acculturation. Accounts of this often violent process can be found in Brooks et al. (1973), Davis (1977), , de Oliveira et al. (1979), Hanbury-Tennison (1973), Hemming (1978), Martins (1982) and Maybury-Lewis (nd.[1983]). The precontact indigenous population of Amazonia and of Brazil are the subjects of a lively academic debate (Denevan, 1970a,b, 1976; Dobyns, 1966; Roosevelt, 1980; Smith, 1981 and others). Denevan (1970a,b: 1976) estimates a population of 6,800,000 for greater Amazonia and 4,932,200 for the Brazilian Amazon. Hemming (1978: 501) estimates about half that value for all of Brazil. Belém's Museu Paraense Emilio Goeldi uses 5 million as the figure for Brazil's indigenous population at the time of European contact, and 230,000 for today, implying a reduction to 4.6% of the original level. Regardless how near the population estimates are to the truth, the decline has been massive. It is the result of thousands of individual incidents, all

of which are in the past. The weight of past incidents does not alter the fact that the same process is still in motion today and will continue unless effective government action is taken to stop it.

As an illustration of the threat to Amerindians as a reality of today, I offer the following incident from the week of this writing (27 April 1985), involving the Arara tribe. In 1970 the Transamazon Highway was built through the lands of the Arara west of Altamira, in the state of Pará. The relationship of the highway and tribal lands can be seen on Goodland and Irwin's map (1975a: 59-62), unfortunately only in the original English-language edition, because the chapter on Amerindians was omitted from the Portuguese-language translation (1975b). Periodic violent incidents occurred between the Arara and the colonists who displaced them in the Altamira Integrated Colonization Project (PIC-ALTAMIRA) of Brazil's National Institute for Colonization and Agrarian Reform (INCRA). Part of the tribal land north of the Iriri River was not colonized due to the failure of attempts by the National Indian Foundation (FUNAI) to dislodge the tribe (Fearnside, 1984). On 22 February 1981, 11 years after the highway was built through the tribe's land, the first peaceful contact was established when gifts were accepted from a FUNAI "pacification" camp (Veja 11 March 1981). Less than four years later, in February 1985, what appears to be the entire population living in the area north of the Iriri River was rounded up by FUNAI and placed in a guarded compound by the Xingú River on the northern fringe of the city of Altamira. As of April 24 the group remained imprisoned in this facility awaiting a decision as to where to resettle the tribe. On April 21, six members of the group escaped

from the camp and fled, reportedly after having been refused permission from FUNAI to return to the forest to seek medicinal plants they believed would cure the illnesses they were suffering from in the camp. Two days later one of the six, an old man, was found dead in the forest about 12 km west of Altamira. The following day the author saw the base camp near this site from which FUNAI parties were attempting to recapture the remaining fugitives.

Some of the land from which the Arara have now been removed in the area 110-240 km west of Altamira is terra roxa (Alfisol), a fertile soil type desired for colonization. According to INCRA functionaries at Km 180 west of Altamira, settlement of this land will begin in July 1985 both in an area near Km 240 where settlement will be done by INCRA and in the area near Km 110 where, since 1975, Amerindian presence has delayed a private settlement scheme to be undertaken by Cooperativa Triticola Serrana (COTRIJUI).

The case of the Arara is only one of many. These incidents belie the myth that nothing now can be done about the plight of Amerindians because they belong only to history.

2.) THE TWO BRAZILS:

Brazil is said to consist of two separate worlds, variously referring to the rich versus the poor, the urban versus the rural, and the developed south versus the undeveloped northeast and Amazon regions. All of these dichotomies contribute to the perceptual barrier impeding decision makers -- and those with the greatest

influence on decision makers -- from appreciating the nature of the Amerindian protection problem.

Most individuals disposed to support the protection of indigenous peoples on humanitarian or other grounds live in Brazil's large cities. Their tendency to view Amerindian problems as a matter of history is partly a function of this geographical and social isolation from the current events in question. While the myths of urban Brazilian culture disseminated through literature, music, films and television generally romanticize Amerindian life, the people living near indigenous groups in the rural Amazon belong to a different world. Due to competition with Amerindians for resources such as land and to the momentum of violence from escalating reprisals on both sides, Portuguese-speaking Luso-Brazilians in actual or potential contact with the tribes have much more hostile views than do urban residents. In the absence of systematic opinion polling to quantify the prevalence of these attitudes, a recent anecdote will serve to indicate their nature.

One week prior to this writing, during one of my regular visits to the area on the Transamazon Highway where I have been studying human carrying capacity in the Altamira colonization area for the past 11 years, heavy rains had made almost all side roads impassable to motor vehicles. This obliged me to spend several days hiking through the mud on foot with a gang of hired workers in order to harvest a series of pasture production monitoring quadrats installed in the area. The hired workers included two sons of colonists in the INCRA settlement project, a man from the northeastern

state of Piauí who had arrived two months previously and was now planting as a sharecropper, and a colonist from the northeastern state of Rio Grande do Norte who had spent 28 years as a rubber tapper elsewhere in Pará prior to coming to the INCRA settlement area. The colonist from Rio Grande do Norte perfectly fitted the stereotypical image of the rural northeastern Brazilian: wearing a leather hat and blessed with the gift for oral history for which that region is famous. During a lunch break he exercised this talent by recounting his experiences as a rubber tapper, including two major massacres of Amerindians in the late 1940's. One was a raid against the Suruí (syn: Mudjetire) tribe in which 60 "civilizeds" killed approximately 300 Amerindians by surrounding a group at night. The other was against the Kaiapó tribe, where 30 "civilizeds" killed approximately 200 Amerindians who had made the mistake of sleeping in a "grotto" with only two exits. Both indigenous groups included women and children. The raiding parties were organized and armed by seringalistas (rubber barons). The colonist's account included details of the deployment and munitions of the men in the raiding parties, the frantic attempts of the Amerindians to escape the crossfire, and graphic descriptions of the Amerindians "eating lead," bodies rolling down the hills, and the sight of several hundred people in their death throes.

It matters little whether or not this piece of oral history has been embellished through years of telling. The figures for the number of victims appear rather large and round. The important point is the reaction of the other workers upon hearing these accounts. They were delighted. There was much laughter and urging of the

storyteller to regale them with more details of the exploits. The raiders were viewed as heroes, and the killing of Amerindians as perfectly justified. Amerindians were labeled as "not producing anything," "only working to hold things back" and as treacherous people who, even after they had been officially designated as mansos (tame), would often revert to killing Luso-Brazilians.

Throughout Amazonia popular opinion favors taking land from Amerindians. Near the Venezuelan border in the territory of Roraima federal authorities have, at least temporarily, removed gold prospectors from the Garimpo da Serra dos Surucucus -- one of several gold mining sites in Yanomamí tribal land. In Boa Vista, the capital of Roraima, local sentiment strongly supports the gold prospectors in their efforts to convince the federal government to reverse its position (see, for example: A Crítica 26 March 1985). In Amazonas state, where the Balbina hydroelectric dam now under construction will flood part of the tribal lands of the Waimari-Atoari, there is not even a hint of doubt evident in the city of Manaus that the expropriation is justified (although more distant violations, such as those in the Yanomamí areas, are condemned). Sympathy for the Amerindians is also minimal in Rondônia, where settlers have had conflicts with the Uru-eú-wau-wau and other tribes. Accelerated migration to Rondônia on the Marechal Rondon Highway (BR-364: Cuiabá-Porto Velho) paved under the POLONOROESTE regional development project makes further conflicts all but inevitable.

It is sometimes suggested that concientização

(consciousness raising) in the Amazonian interior could induce residents to tolerate and even defend tribal groups. However, strong and widespread hostility in these areas means that to trust to such a course would be to condemn the remaining indigenous population to death, as any change would be too slow to have effect before the last Amerindians disappear.

STRATEGIES TO PROTECT AMERINDIANS

Several lines of reasoning lead to the conclusion that government leaders would be wise to protect indigenous groups. One is the parallel interests of protecting indigenous peoples and protecting areas of natural forest. While the case for Amerindians as environmentally benign managers and guardians of the forest can sometimes be overstated, the activities of these groups are much less destructive to the forest than any nonindigenous use pattern presently applied. Potentially grave environmental consequences of large scale deforestation provide ample justification for maintaining a significant part of Amazonia in native forest (Fearnside, 1985). Environmental concerns alone should therefore be sufficient to justify protecting indigenous peoples.

A second line of argument sometimes advanced for saving indigenous cultures is that they are the repositories of a tremendous store of knowledge of the rainforest flora and fauna, which could be economically valuable if learned by the dominant culture. This is quite true, especially for medicinal plants. To this day most pharmaceutical compounds are first identified by isolation from

plants, and only later are they synthesized for commercial distribution. Rediscovering the indigenous knowledge of pharmacological properties through random testing of the chemicals contained in plants would be impractical. This alone should make Amerindian protection attractive, especially protecting the tribes in their own habitats rather than deporting them to "Indian parks" in other parts of the region where much of the tribes' store of knowledge is inappropriate to the local species. However, it is important to remember that the rationale of economically useful knowledge has the danger of leading to the conclusion that, once this knowledge has been extracted from the tribes, the people and their cultures can be liquidated with impunity.

Ultimately, Amerindian protection must be viewed as a question of basic human rights, as guaranteed in Brazil's constitution. Amerindian lands are explicitly protected:

The lands inhabited by forest dwellers are inalienable as determined by federal law; permanent possession belonging to them; the exclusive use of the natural resources and of all the advantages therein contained being recognized as their rights.

Laws of whatever kind, having the objective of domination, possession or occupation of lands inhabited by forest dwellers, are declared null and void. (A Nova Constituição do Brasil de 17 de outubro de 1969, Artigo 198, Título V. Diário Oficial de 30 de outubro de 1969).

The concept of Brazil as a pluralistic society where the

integrity of minorities is guaranteed negates the rationalization almost invariably employed in justifying development projects: that there are only a few Amerindians displaced by the takeover of tribal lands for any one specific project. Constitutional rights are not a question of numbers. Neither are human rights. (1)

NOTE

(1) Paper presented at the round table on "A Questão da Fronteira: Terras Indígenas e Processo Fundiário," Museu Paraense Emílio Goeldi, Belém, Pará, 25 April 1985. I thank the Foundation for Environmental Conservation for permission to reprint Figure 1 (Fearnside and Ferreira, 1984). Ellen Levy and Sherre Prince Nelson helped with the cartography. I thank N. Arvelo-Jimenez, K.F. Durham, J.G. Gunn, N. Leal Filho, F. Peralta, J.M. Rankin, J. Robinson, A. Rylands, M. Schänck, D. Smith and C. Wood for comments on the manuscript.

REFERENCES

Bodard, L. (1972): Green Hell: Massacre of the Brazilian Indians. (New York, Outerbridge and Dienstfrey) 291 pp.

Brazil, Companhia de Desenvolvimento Agro-Pecuária de Rondônia. (1983): Núcleos Urbanos de Apoio Rural POLONDRÓESTE, Estado de Rondônia. Map scale: 1:1,000,000. (Porto Velho, CODARON). 1 sheet.

Brazil, Conselho Interministerial do Programa Grande Carajás.

(1981): Programa Grande Carajás: Aspectos Físicos,

Demográficos e Fundiários. (Rio de Janeiro, Conselho

Interministerial do Programa Grande Carajás). Pages unnumbered.

Brazil, Departamento de Estradas de Rodagem do Pará (DER-PA).

(1982): Mapa Rodoviário. Map scale: 1:100,000. (Belém, DER-PA).

Brazil, Departamento de Estradas de Rodagem de Rondônia (DER-RO).

(1982): Rondônia. Map scale: 1:1,000,000. (Porto Velho, DER-RO).

1 sheet.

Brazil, Ministério das Minas e Energia, Projeto RADAMBRASIL. (1983):

Amazônia Legal. Map scale: 1:2,500,000. (Rio de Janeiro, Projeto

RADAMBRASIL). 2 sheets.

Brazil, Ministério do Interior, Fundação Nacional do Índio

(FUNAI). (1984): Mapa do Brasil com Posicionamento das Áreas

Indígenas. 20 de junho de 1984. Map scale: 1:5,500,000 (Brasília,

FUNAI). 1 sheet.

Brooks, E., Fuerst, R., Hemming, J. and Huxley, F. (1973): Tribes of

the Amazon Basin in Brazil 1972. (London, C. Knight) 201 pp.

Conselho Indigenista Missionário (CIMI). (1982): Índios no Brasil

e Presença Missionária. Map scale approximately 1:8,000,000

(São Paulo, CIMI). 1 sheet.

A Critica (Manaus). (1985): "Novos planos para invadir Surucucus."

26 March 1985, Section 1, p. 7.

Davis, S. (1977): Victims of the Miracle: Development and the Indians of Brazil. (Cambridge, U.K., Cambridge University Press) 205 pp.

Denevan, W.M. (1970a): The aboriginal population of western Amazonia in relation to habitat and subsistence. Revista Geografica 72: 61-86.

Denevan, W.M. (1970b): The aboriginal population of tropical America: problems and methods of estimation. pp. 251-69 In: Deprez, P. (ed.) Population and Economics. (Winnipeg, Manitoba, Canada, University of Manitoba Press).

Denevan, W.M. (1976): The aboriginal population of Amazonia. pp. 205-34 In: Denevan, W.M. (ed.) The Native Population of the Americas in 1492. (Madison, Wisconsin, U.S.A., University of Wisconsin Press).

de Oliveira, A.E., Cortez, R., Velthem, L.H., Brabo, M.J., Alves, I., Furtado, L, da Silveira, I.M. and Rodrigues, I. (1979): Antropologia social e a política florestal para a Amazônia. Acta Amazonica 9(4) suplemento: 191-95.

Dobyns, H.F. (1966): Estimating aboriginal American populations: an appraisal of techniques with a new hemispheric estimate. Current

Anthropology 7(4): 395-416.

Fearnside, P.M. (1982): Deforestation in the Brazilian Amazon: how fast is it occurring? Interciencia 7(2): 82-88.

Fearnside, P.M. (1984): Brazil's Amazon settlement schemes: conflicting objectives and human carrying capacity. Habitat International 8(1): 45-61.

Fearnside, P.M. (1985): Environmental change and deforestation in the Brazilian Amazon. pp. 71-89 -In: Hemming, J. (ed.) Change in the Amazon Basin: Man's Impact on Forests and Rivers. (Manchester, U.K., Manchester University Press). 222 pp.

Fearnside, P.M. (nd-a): The causes of deforestation in the Brazilian Amazon. In: Dickenson, R.E. (ed.) Geophysiology of Amazonia. (New York, John Wiley and Sons) (In press).

Fearnside, P.M. (nd-b): Deforestation and decision-making in the development of Brazilian Amazonia. Interciencia (In press).

Fearnside, P.M. and Ferreira, G. de L. (1984): Roads in Rondônia: Highway construction plans and the farce of unprotected reserves in Brazil's Amazonian forest. Environmental Conservation 11(4): 358-60.

Fearnside, P.M. and Salati, E. (1985): Desmatamento explosivo em Rondônia. Ciência Hoje (In press).

Goodland, R.J.A. (1978): Environmental Assessment of the Tucuruí Hydroproject, Rio Tocantins, Amazonia, Brazil. (Brasília, Eletronorte) 168 pp.

Goodland, R.J.A. and Irwin, H.S. (1975a): Amazon Jungle: Green Hell to Red Desert? an Ecological Discussion of the Environmental Impact of the Highway Construction Program in the Amazon Basin. (New York, Elsevier) 155 pp.

Goodland, R.J.A. and Irwin, H.S. (1975b): A Selva Amazônica: do Inferno Verde ao Deserto Vermelho? (São Paulo, Editora Itatiaia/Editora da Universidade de São Paulo) 156 pp.

Hanbury-Tenison, R. (1973): A Question of Survival for the Indians of Brazil. (London, Angus and Robertson) 272 pp.

Hemming, J. (1978): Red Gold: the Conquest of the Brazilian Indians. (Cambridge, Mass., Harvard University Press).

International Bank for Reconstruction and Development (IBRD) (1981): Brazil: Integrated Development of the Northwest Frontier. (Washington, D.C., The World Bank) 101 pp.

Martins, E. (1982): Nossos Índios, Nossos Mortos. (Rio de Janeiro, Editora Codecri) 310 pp.

Maybury-Lewis, D. (ed.) (nd. [1983]): In the Path of POLONOROESTE:

Endangered Peoples of Western Brazil. (Cambridge, Mass., U.S.A., Cultural Survival) 66 pp.

Porantim (São Paulo). (1981): "Aeroporto dividirá as terras dos Guajajara" September 1981, p. 6.

Roosevelt, A.C. (1980): Parmana: Prehistoric Maize and Manioc Subsistence along the Amazon and Orinoco. (New York, Academic Press) 320 pp.

Smith, N.J.H. (1980): Anthrosols and human carrying capacity in Amazonia. Annals of the Association of American Geographers 70(4): 553-66.

Veja (Rio de Janeiro) (1981): "Os Arara saem da Mata" 11 March 1981, pp. 72-76.

TABLE 1: HIGHWAYS AND AMERINDIAN RESERVES IN THE GRANDE CARAJAS PROGRAM AREA

Reserve number (on Map in Fig.1)	Tribe	Reserve type ^(a) (as of Jun.1984)	Refer- ence for reserve	Cuts by highways and other violations	Refer- ence for cuts ^(b)
1	Caiapó (Kaiapó)	6	1	Connection PA-150-Gradaús (?) (planned)[not shown in Fig. 1]	4
2	Cateté	1	1	BR-158 (?) (planned) [not shown in Fig. 1]	6
3	Bacajá		2	BR-158 (planned)	2
4	Coatinemo	6	1	PA-167 (planned; cut outside of Grande Carajás area)	2
5	Açurine	1		BR-158 (planned) PA-167 (planned; cut outside of Grande Carajás area)	2
6	Paracaná	6	1	BR-230 Tucuruí Reservoir	4
7	Trocara	3	1	PA-156	3
8	Amambé	7	1		
9	Amanaies	6	1	Transmission line (?) ^(c)	5

Table 1F. 2

10	Mãe-Maria	1	1	BR-222 (formerly PA-070)	
2,3,4,5				PA-150	3
				Railway	2,4
				Transmission line (Marabá-Imperatriz)	5
11	Sororó	3	1	PA-153	2
12	Xamboia		1		
13	Açará-Mirim				
14	Craos	1	1	BR-230	3,4
	(Kraolândia, (Anpinaê)			PA-126	3
				BR-010 (?) [not shown in Fig. 11	4
				Ligação BR-230-Nazaré	3
15	Gricati	6	1	Monte Altos-Sítio Novo	3,4
	(Krikati)			Monte Altos-Amarante do Maranhão	4
16	Governador	3	1		
17	Arariboia	1	1		
18	Carú		1		
19	Alto Turiaçu	3	1		
20	Moro Branco	3	1	PA-252 (planned)	2
	("Alto do Rio Guamá")			PA-108 (planned)	2
				PA-124 (planned)	2
21	Pindaré		1	BR-316	3,4
				Airport (planned)	7
22	Geralda e Toco Preto	6	1		

23	Juruá Urucu (Urucu Juruá)	6	1		
24	Lagoa Comprida	1	1		
25	Cana Brava e Guajajara	1	1	BR-226	3,4
26	Anhambe	6	1		
27	Bacurizinho	3	1		
28	Porquinhos	2	1		
29	Canela (Kanela)	3	1	Fortaleza dos Nogueiras- Resplanaldes	4
30	Roeador		1		
31	Uaça		1	BR-230	2
32	Pucurui	(*)	4	BR-422 (new route)	
5					

(*) Reserve type codes: 1=demarcated, 2=registered in land office (cartório), 3=registered in SPU, 4=approved (homologado), 5=declaration of occupation (Decree 88.118/83), 6=identified, 7=to be identified. Source for reserve types: FUNAI map (Brazil, Ministério do Interior, FUNAI, 1984).

(*) References: 1=Brazil, Ministério do Interior, FUNAI, 1984; 2=Brazil, Departamento de Estradas de Rodagem do Pará, 1982; 3=Brazil, Ministério das Minas e Energia, Projeto RADAMBRASIL, 1983; 4=Brazil, Conselho Interministerial do Programa Grande Carajás, 1981; 5=Goodland, 1978; 6=Map in the Companhia do Vale do Rio Doce (CVRD) "Ecology Center", Serra dos Carajás; 7= Porantim September 1981: 6.

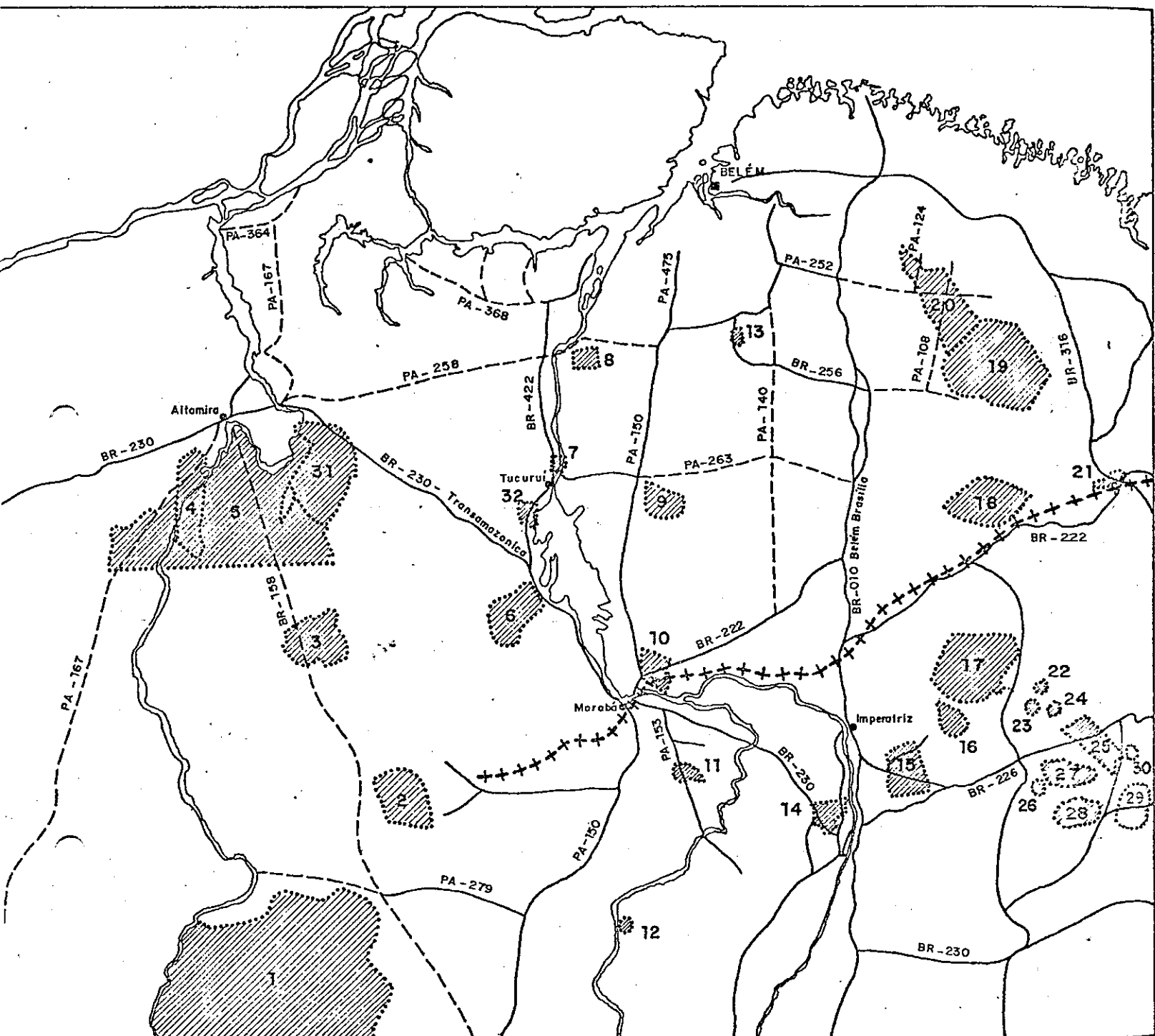
'e' Possible cut according to Goodland (1978: 48, 54, citing ELETRONORTE Map No. DT-TUC-TELS 047/76).

'e' The Tucuruí reservoir flooded more than half of the Pucurui Reserve, which apparently no longer exists since it is not included in the FUNAI map (Brazil, Ministério do Interior, FUNAI, 1984). Demarcation of the Pucurui Reserve was halted in 1972 because of construction of the Transamazon Highway (BR-230), which bisected the reserve. The Pucurui Reserve was also cut by the BR-422, connecting the BR-230 with the town of Tucuruí, and again by the new route of the BR-422 after moving the portion flooded by the reservoir (Goodland, 1978: 46-52).

FIGURE LEGENDS

Fig. 1 -- Area of the Grande Carajás regional development program, showing 14 Amerindian reservations cut by existing and planned highways. See Table 1 for explanation and references.

Fig. 2 -- State of Rondônia showing existing and planned highways. Six Amerindian reserves and two biological reserves are cut. Source: Fearnside and Ferreira (1984).



KEY:

- Existing highways
- - - Planned highways
- + + + + Railways
- ▨ Amerindian reservations

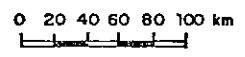
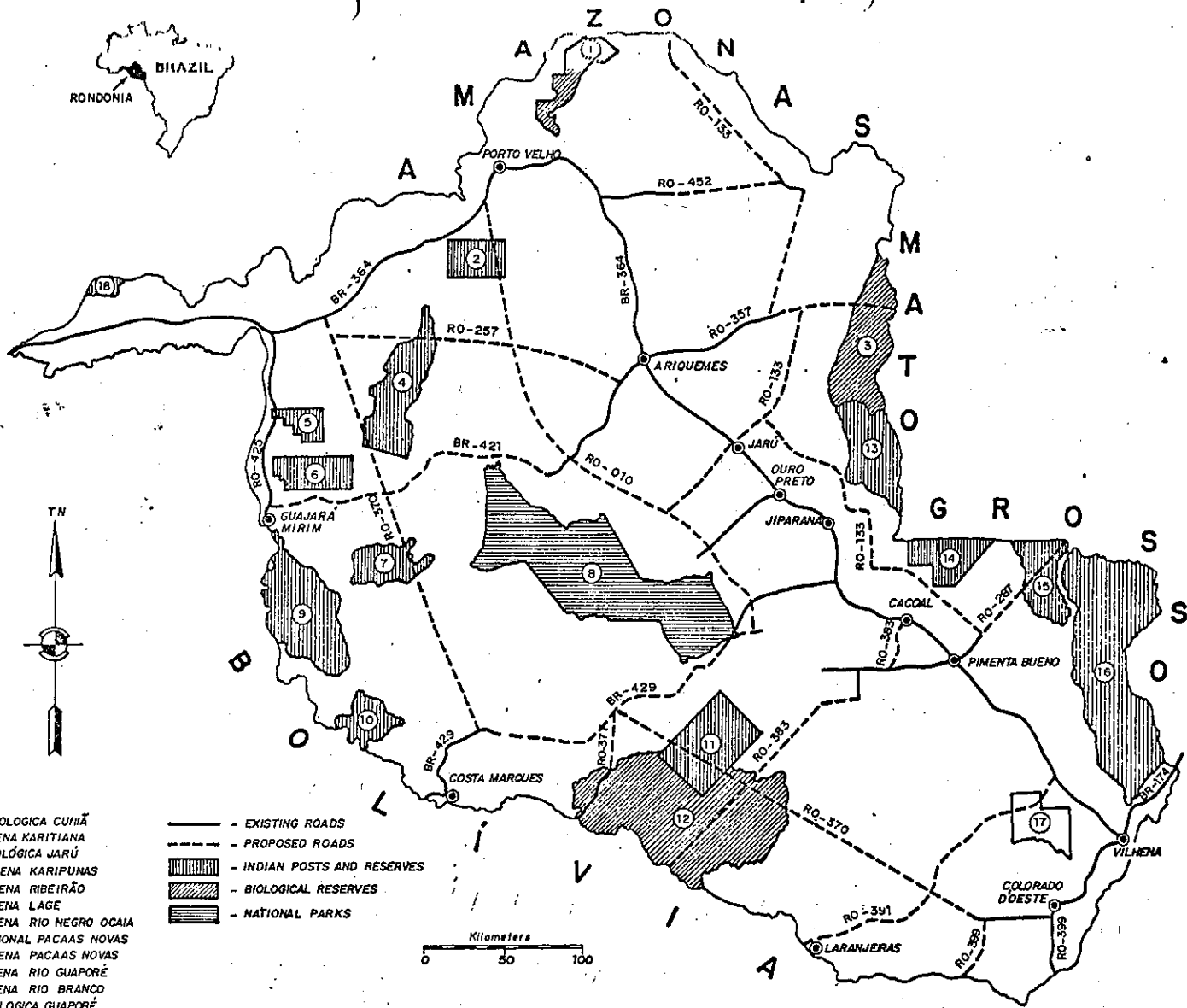


FIG. 1



- 1 - RESERVA ECOLÓGICA CUMÃ
- 2 - POSTO INDÍGENA KARITIANA
- 3 - RESERVA BIOLÓGICA JARÚ
- 4 - POSTO INDÍGENA KARIPUNAS
- 5 - POSTO INDÍGENA RIBEIRÃO
- 6 - POSTO INDÍGENA LAGE
- 7 - POSTO INDÍGENA RIO NEGRO OCAIA
- 8 - PARQUE NACIONAL PACAAS NOVAS
- 9 - POSTO INDÍGENA PACAAS NOVAS
- 10 - POSTO INDÍGENA RIO GUAPORÉ
- 11 - POSTO INDÍGENA RIO BRANCO
- 12 - RESERVA BIOLÓGICA GUAPORÉ
- 13 - POSTO INDÍGENA LOURDES
- 14 - POSTO INDÍGENA 7 DE SETEMBRO
- 15 - POSTO INDÍGENA ROOSEVELT
- 16 - POSTO INDÍGENA ARIPUANÃ
- 17 - POSTO INDÍGENA TUBARÕES
- 18 - POSTO INDÍGENA KAXARDA

- EXISTING ROADS
- - - PROPOSED ROADS
- ▨ INDIAN POSTS AND RESERVES
- ▩ BIOLOGICAL RESERVES
- ▧ NATIONAL PARKS

Kilometers
0 50 100

FIG. 2