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Territorial Regulation in the Small-Scale Fisheries of Itoman, Okinawa

メタデータ	言語: English 出版者: 公開日: 2009-04-28 キーワード (Ja): キーワード (En): 作成者: 秋道, 智彌 メールアドレス: 所属:
URL	https://doi.org/10.15021/00003291

SENRI ETHNOLOGICAL STUDIES 17 1984

Territorial Regulation in the Small-Scale Fisheries of Itoman, Okinawa

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Variables moulding territorial rights in small-scale fisheries are multiple. Up to now, analyses of territoriality have mainly focussed on well-defined and institutionalized aspects of the "Law of the Sea." Failure to consider non-institutionalized but nevertheless locally enforceable aspects of territoriality leads to a misinterpretation of the wide spectrum of human territorial behavior.

This paper attempts to remedy that situation by providing a detailed case study on informal regulation in small-scale fisheries in a sub-tropical fishery conducted in the inshore waters of Itoman, Okinawa. More than 200 informally defined territories, together with the rules associated with the tenurial behavior of fishermen provide a new perspective in the study of territoriality. Although study of informal tenure systems permits elucidation of psychological, behavioral and ethical aspects of small-scale fishermen's behavior, its ultimate implication lies in a flexibility toward environmental, technological and social factors. This demands an understanding of the variables that impinge on territorial rights, such as fish ecology, micro-environmental gradients, typhoon effects and contemporary environmental changes, particularly those induced by land reclamation and the introduction of new technologies. Study of informal regulation mechanisms jointly with the formal mechanisms elicits new methodological and theoretical tools for use in clarifying sea tenure systems in their totality.

INTRODUCTION

As a consequence of increasing claims to the optimal use of natural marine resources worldwide, together with the subsequent rise of international disputes on sea tenure, the concept of territoriality in the maritime environment has increasingly attracted the attention of anthropologists, marine biologists and policy-makers, among others.

Territoriality in fisheries is open to various broad definitions, depending on the type of fishery concerned [ACHESON 1975; CHRISTY 1982], and more basically according to culture and society. Whatever the sea territory defined its macro-level implications appear to lie, in terms of its institutions and relevant rights, somewhere between the two extreme forms of exclusive rights and no property [PEARSE 1981].

Territoriality does not always demand written documents or closely codified jurisdictions for the administration of sea tenure. In Japan, for example, territoriality is legally enforced via exclusive use rights and well-documented fisheries laws [HABARA 1957; NINOHEI 1978].

By contrast, in a number of Pacific island communities ownership of reef and sea have long existed, as Johannes [1978a] overviews. Such traditional laws of the sea are culturally sanctioned and form integral and sophisticated parts of oral traditions and customary rules. In Ulithi atoll, in the Carolines, ownership of sea territory is closely associated with the political organization and the hegemony of chiefs or headmen [USHIJIMA 1982], or with religious restrictions and beliefs in limiting access during tabooed periods, as are seen in Tikopia [FIRTH 1965], Malaita, in the Solomon Islands, [AKIMICHI 1981], and Satawal, in the Carolines [AKIMICHI n.d.].

In most detailed studies of both Japanese and Oceanic cases, however, territoriality appears to denote only institutionalized and formal aspects. But when attention is directed to the personal or interpersonal levels in fisheries different aspects of territoriality emerge. For instance, in many societies priority claims to fishing grounds seem to be widely practised where entry rights are equal for all fishermen. Priority claims are only implicitly admitted as rational among fishermen [RUDDLE and AKIMICHI n.d.], and to break the rule is against ethical conduct. In Tobi-shima, northern Japan, octopus holes were owned and inherited as a personal property [NAGAI 1951]. Such informal aspects of territoriality need careful consideration since practical jurisdictions are based on, and often have originated from, informal and customary rules that are widely recognized among fishermen and are deeply embedded in local customs.

Hence the mechanisms by which territoriality is sustained appear to be twofold: legally sanctioned and institutionally authorized aspects, and implicitly recognized but practically enforceable ones. Distinction between the two is not, however, clear-cut, and a broader spectrum of intermediate measures exists. However, it is my premise that territoriality has been designed as an integrated system of both formal and informal components, and that analysis should be directed to identify and interprete them, as well as to elucidate internal processes within the system.

The function of territoriality is another crucial issue. The principal goals of territoriality can be broadly described as social and economic equity in the access to resources, the avoidance of dispute and conflict and resource conservation. Even if one system of territoriality is desirable in a given area and under particular socio-economic conditions, the range of its applicability might change through time and in different areas. For instance, population growth, environmental change or the penetration of a market economy [ALEXANDER 1977] have the potential to cause inconsistency and increase stress and malfunction of given territorial regulations. Territoriality should, then, be understood as a series of processes operating through time. Again, informal regulations may arise as a cue to evaluate territorial behaviors of fishermen under changing conditions. In sum, an understanding of territoriality

in fisheries should be focussed equally on both the formal and informal aspects of a diachronically changing system.

In this paper I will discuss the formal and informal regulation of the sea, using data from a small-scale fishery conducted in the sub-tropical waters of Okinawa Island, southwestern Japan. My first objective is to describe briefly the institutional aspects of sea tenure in the study area, Itoman. Secondly, I examine the system of territoriality, using as an example the informal aspects of a stake net fishery (*ambushi*). Lastly, the ecological significance of the contemporary sea tenure system in the area is discussed. This paper is based on data collected during fieldwork conducted at Itoman since 1979.[1)]

FORMAL REGULATIONS IN THE SMALL-SCALE FISHERY

The Itoman Setting

Itoman is located about 10 km south of Naha, the capital of Okinawa Prefecture. It occupies the southwestern part of Okinawa Island and faces the East China Sea

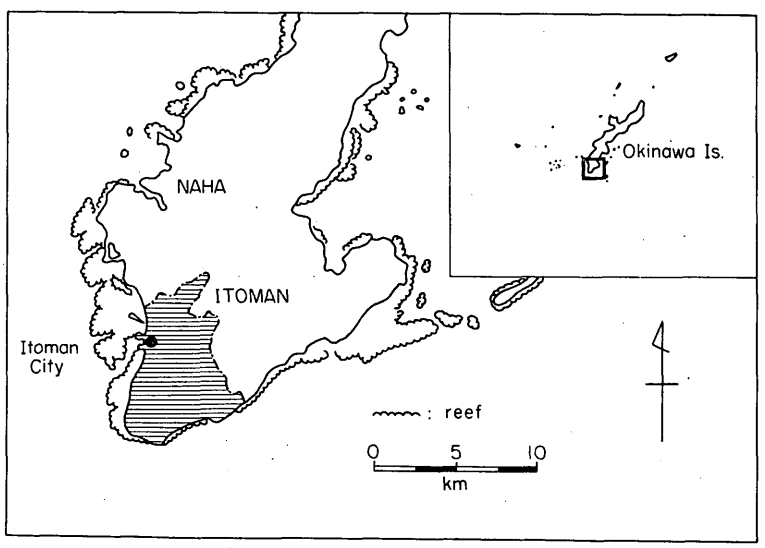


Figure 1. Location of Itoman

1) Research was partly supported by grants from the Japanese Ministry of Education, Science and Culture. I am deeply indebted to two key informants, Kōkichi Uehara and Shige-ichi Uehara, the stake net fishermen of highest repute in Itoman. I greatly appreciate the kind support of Ryōtoku Shimabukuro (Committee of Cultural Properties Preservation, in Itoman) during my fieldwork. I also thank Dr. R. E. Johannes for his valuable comments and assistance. Lastly, special thanks go to the late Mr. Noboru Innami and Mr. Masashi Takagi, fisheries officers of the Fisheries Section, Okinawa Prefectural Government, for providing access to documents.

(Fig. 1). Fringing reefs, about 3 km at their widest, and partly breached by channels, are developed along the coast.

Historically, Itoman was well-known as the center of Okinawan coastal and offshore fisheries. *Ichimanā* (Itoman fishermen) have, in fact, a brilliant history of fishing activities, not only in the Ryukyus proper and mainland Japan, but also in Southeast Asia, Micronesia and Melanesia. Breath-holding diving, fish driving and pole-and-line fishing for bonito, comprised the major fishing traditions of *Ichimanā*. However, owing to the decline of coastal fisheries and overseas fishing expeditions, modernization of the fishery sector, and, more seriously, as a consequence of large-scale land reclamation in the harbor area, Itoman's maritime traditions have recently undergone drastic socio-economic change. In this section the formal aspects of territoriality are discussed.

History of Sea Tenure in Itoman

During feudal times, prior to the Meiji Restoration (1868), rights to exploit a sea territory (*umi-hō-giri*) fronting each village were claimed for exclusive use. The sea territory corresponded to the coastal waters of the village territory (*magiri*) [RYŪKYŪ SEIFU 1968]. According to the village laws of Kanegusuku-Magiri (which includes Itoman village), its sea territory was divided into three; south, middle and west. Three villages controlled, in turn, each of these three sections during a year. Fishing outside the corresponding sea territory was banned and those who fished illegally were charged prevailing prices for the fish "stolen." Also, fishermen 17–49 years-of-age had to contribute marine products for the festivals (*tatācha*) in honor of sea-gods and ancestors, which were held three times a year. Illegal fishing was also banned [RYŪKYŪ SEIFU 1965].

During feudal times use rights in fisheries were not solely village-oriented, and some territories were owned jointly by fishermen from different villages. Itoman, in particular, was one of the most progressive and developed fishing villages in Okinawa during feudal times and Itoman fishermen migrated seasonally to other villages or islands for fishing. In such cases they made registrations by paying fees either for entry or for rights to fish. In the 1670s, for instance, entry rights to uninhabited islands and reefs located off southwestern Okinawa main island were authorized for use by Itoman fishermen through monetary contracts between the Ryūkyū Government and Itoman. The government also made similar contracts with other villages [TAMASHIRO 1915].

Following passage of the Meiji *Fisheries Law*, in 1901, a licensing system was adopted nationwide, as the major regulatory measure in coastal fisheries. The Fisheries Cooperative Association (FCA), which was village-based during the initial stage, became the administrative focus for obtaining fisheries rights and also for the control and execution of associated formal rules and rights (membership, type and season of fishery, sea territory and so forth).

Itoman's dominant role in the coastal fisheries of Okinawa was reinforced during the post-Meiji period via the securing of entry rights to the sea territories of other

villages. Indeed, areas exploited by Itoman fishermen included all the major fishing grounds of Okinawa Island and its dependent small islands, as well as the Miyako and Yaeyama groups [see AKIMICHI and RUDDLE, this vol.]. However, the establishment of village-based FCAs and the subsequent rise of local exclusionism (particularly toward fishermen from Itoman) greatly reduced the opportunity for Itoman fishermen to conduct fisheries in coastal waters controlled by other villages. Litigation and the disputes that burst forth in the first two decades of this century between the Itoman and local fishermen were inevitable [ITOMAN SHI-SHI HENSHŪ IINKAI 1983].

As might be expected, the ranges and contents of territories claimed by each FCA have not remained the same during these one hundred years, but have undergone considerable changes. Apart from the expansion and contraction processes of the areas exploited by Itoman, village sea territory *per se* was transformed through formal revisions to the Fisheries Laws. According to the exclusive fisheries rights of Itoman FCA, officially approved in 1908, the exclusive sea territory was roughly rectangular in shape (Fig. 2-1). The lateral boundaries correspond to the seaward extension of the village boundaries (*magiri*) whereas the offshore limit extends beyond the fringing reef and is between 2.5 and 3 nm from the shoreline.

This license was effective until 1928 (for twenty years). It was then renewed and remained effective until 1947. In 1965, Itoman FCA claimed a communal fisheries rights territory, based on the *Fisheries Law* (1949). Subsequently this has been renewed three times (1970, 1974 and 1983). As is shown in Figure 2-1, the present-day sea territory is much wider than that of the Meiji Period.[2)]

Present-day Fisheries in Itoman

Present-day fisheries conducted by the members of Itoman FCA are characterized by two distinctive components: small-scale fisheries in coastal waters, and medium

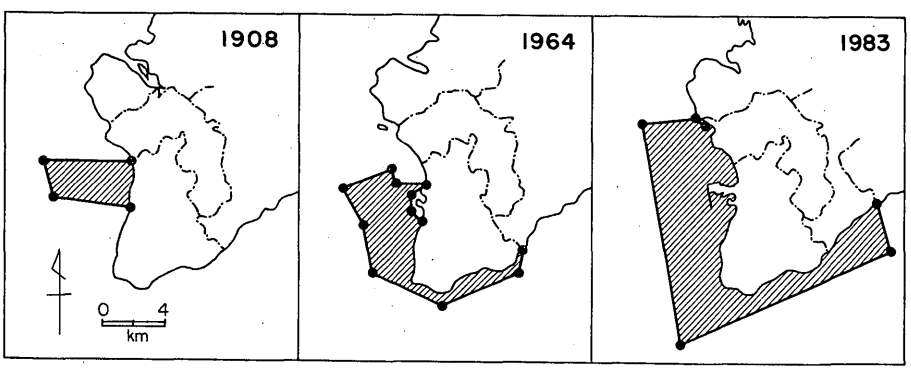


Figure 2–1. Historical Changes in the Sea Territory of Itoman
Sources: [NŌSHŌMUSHŌ 1909; RYŪKYŪ SEIFU 1964; ITOMAN GYOGYŌ KYŌDŌ KUMIAI 1983; See also NŌRINSHŌ 1928 ; OKINAWA-KEN 1974.]

2) The causes and processes of these changes are discussed by AKIMICHI and RUDDLE (this vol.).

and large-scale operations offshore. Near the reef flat and off the seaward slope and its vicinity small fishing boats of less than one ton are mainly employed for net fishing (using gill nets, the fish-drive, and stake nets), trolling and seaweed aquaculture, whereas in deep waters larger vessels, of over three tons, are used for catching surface swimmers, such as tuna by long lining and demersel snappers by using bottom lines. The total yields of the latter far exceed those of the former. The number of

Table 1. Fishing Boats by Tonnage Group and by Technique Employed

Fishing Technique	Tonnage Group					
	<1	1-3	3-5	5-10	>10	Total
Long line	3	30	16	11	7	67
Bottom line	5	30	4	0	0	39
Troll line	40	32	0	0	0	72
Diver	4	7	0	0	0	11
Gill net	9	4	0	0	0	13
Fish drive	3	0	0	0	0	3
Stake net	2	0	0	0	0	2
Seaweed aquaculture	18	8	0	0	0	26
Miscellaneous	7	7	1	0	0	15
Total	91	118	21	11	7	248

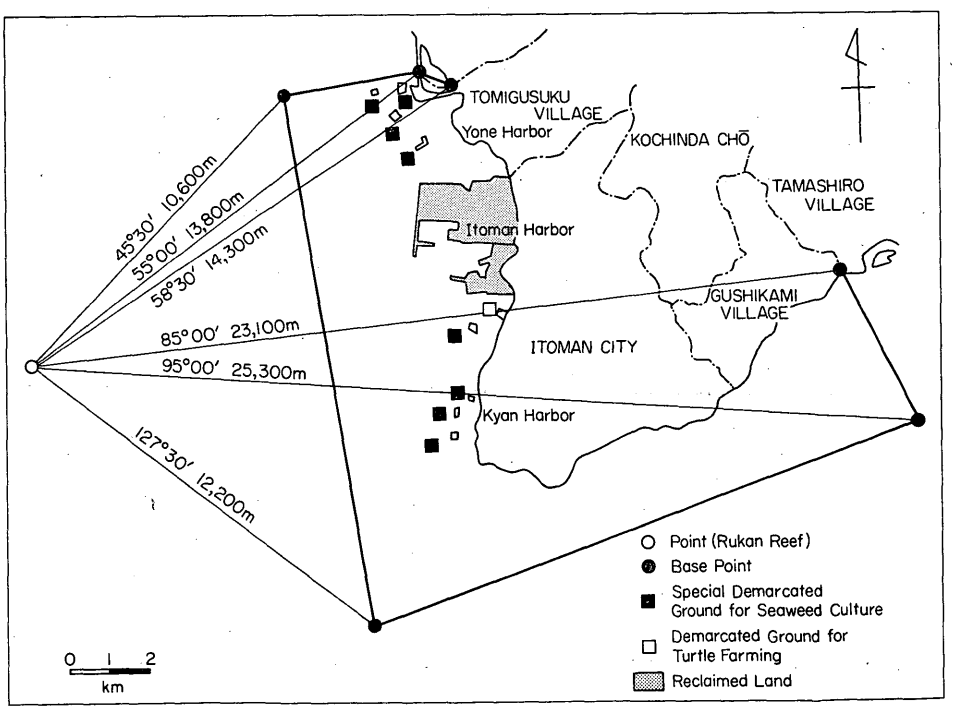


Figure 2–2. Joint Fisheries Rights of Itoman FCA in 1983
Source: [ITOMAN GYOGYŌ KYŌDŌ KUMIAI 1983]

fishing boats by tonnage group and fishing technique is shown in Table 1.

The allocation of present-day territories claimed by the three types of fisheries rights is also shown in Figure 2-2. In terms of space use within the area four distinctive categories of fishing occur (license no. 16, the latest retained by Itoman FCA and Minatogawa FCA [ITOMAN GYOGYŌ KYŌDŌ KUMIAI 1983]):

(1) joint fisheries rights for collecting benthic animals and seaweeds;

(2) joint fisheries rights to conduct fisheries using nets and fish traps (gill net, stake net, small-scale fixed net, fish-drive, and fish trapping);

(3) demarcated fishery for turtle farming; and

(4) special demarcated fisheries rights for culturing seaweeds (*Nemacystus* spp.).

The first two types are permitted anywhere within the territory, whereas the latter two can be conducted only in small defined portions of the enclosed sea area within the territory. The other types of fisheries (*e.g.*, line fisheries) can be undertaken freely inside or outside the territory [KANEDA 1980].

For marine resource conservation and fishery control, in general, several regulations are enforced regarding fishing season, size limitation, fishing gear and number of gear units permitted. For benthic animals and seaweeds the regulations appear to be common to all Okinawan FCAs, and any differences might reside in the local diversity of marine resources. In contrast, regulations for net fisheries vary considerably per FCA and per individual fisherman with regard to the maximum number of fishing nets that can be employed.

Overall, macro-level formal regulations on territoriality primarily provide for the spacing behavior of fishermen. The effectiveness, contradiction and ecological consequences of this formal aspect can, however, be understood only by considering the informal or micro-level component.

THE STAKE NET FISHERY

Stake netting, locally termed *ambushi* (lit. *ami*: "net", *bushi*: "to drain off" or "to turn down"), has been practised not only in Okinawan waters, but nationwide, and is known generally in Japan as *tateboshi-ami* [*cf.* KANEDA 1977]. According to the documents of Exclusive Fisheries Rights for the late-1900s, Itoman fishermen had already made contracts to conduct *ambushi* fishing as well as fish driving and other techniques in the territorial waters of other villages, in return for paying an entry charge (*umi-gane*) [TAMASHIRO 1915]. A brief examination of a list of exclusive fisheries rights proclaimed by FCAs, and more rarely by individuals, reveals that the *ambushi* technique was adopted by twenty-seven of total of fifty-four FCAs in Okinawa Prefecture.

Procedures and catch

The method of *ambushi* fishing is basically similar to such techniques as the fixed net and stand net; *i.e.*, the setting of stationary gear in shallow waters to catch fish by taking advantage of tidal movements and corresponding fish behavior. A net is

set at high tide when fish feed at grass beds in shallow waters. When fish retreat toward deep water with tides, they enter the net. In a sense the stone weir, which is widespread in the tropical Pacific [ANELL 1955; REINMAN 1967] and was formerly important in Okinawan waters [SHIMABUKURO 1966; NISHIMURA 1975], is a prototype of this technique.

An *ambushi* net is composed of two main parts; a bag net (*fukuru-ami*) and two wing nets (*tībashi-ami*). A bag net is set using poles fixed in a semi-rectangular shape at the site of coral rock about three to four fathoms deep. Wing nets are attached to each side of the bag net and both edges are inflected to prevent fish from escaping (Fig. 3). Coral rocks are used to fix the net to the bottom. Ordinarily, the length of the two wing nets is the same, but occasionally a longer wing net (*nagarī*) and a shorter one (*inkarī*) are employed, depending on the topographical features of the fishing ground. They are usually 50–100 m long.

The spot where a bag net is located is generally termed *ishiyā* or *tuiba*. A fishing site is carefully selected where two or more coral rocks occur. These rocks not only provide the small fish passage (*kuchi*: "mouth") into a bag net, but also are used for fixing the poles. Where coral rocks are not naturally available fishermen carry them in their boats. Usually, these fishing sites are given particular names. For instance, more than two hundred named sites for *ishiyā* are distinguished and recognized among the *ambushi* fishermen of Itoman. These are designated as *Amuru-no-hē* (south of *Amuru* reef), *Shinaganchi-uchi-no-hē* (south of *Shinaganchi*'s and coastward), and the like.

An *ambushi* catch comprises various fish species and marine animals. Commonest catch compositions are rabbitfish (*Siganus* spp.), goatfish (*Parupeneus* spp. and *Mulloidichthys* spp.), silver biddies (*Gerres* spp.) and other reef fish such as parrotfish, sea-perch, barracuda and wrasse. Apart from fish, cuttlefish (*Sepia* spp.), squid (*Sepioteuthis* sp.), octopus and crabs are also commonly caught [*cf.* YOSHINO *et al.* 1975; MASUDA *et al.* 1978; and see Appendix I]. The *ambushi* is employed

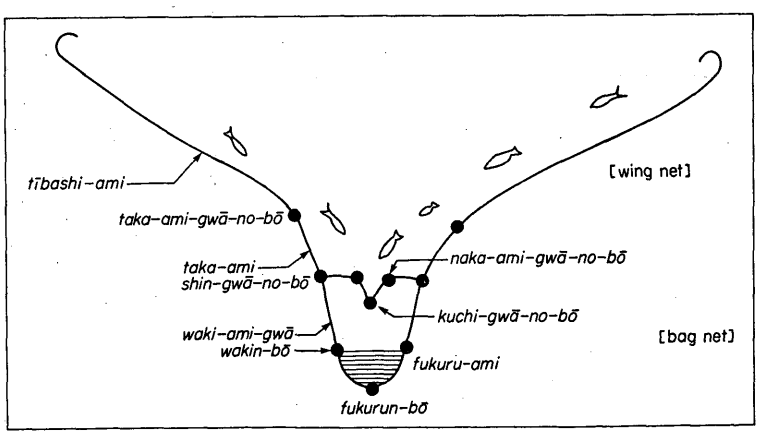


Figure 3. Stake Net

year-round, although during January and February fishing is less productive because of the strong northerly winds and rough seas, even inside the reef. Also, the frequent occurrence of typhoons, particularly in September and October, reduces fishing intensity and catch size (*vide infra*).

Ambushi fishing is individualistic in nature. Normally each fisherman works alone with his own small *sabani* boat and netting gears. But in former times a father and son team worked together.

Socio-cultural background

Ambushi is especially important for Itoman fishermen since young boys were formerly initiated by this technique as the first major fisheries task to be learned. Their training period in *ambushi* lasted at least one or two years, after which they could start to learn the more difficult work, such as fish driving, in deeper waters. Indeed, use of the *ambushi* was a rite of passage for future independent fishermen.

Those who were able to be full-time *ambushi* specialists (*e.g.*, *ambushisā*) were generally affiliated as members of particular social group, known as the *munchū* or *bara* (lit. [*bara*]: "abdomen"), indigenous descent groups in Okinawan society. In the early Showa Period (1920s), 42 *munchū* existed in Itoman [ITOMAN-CHŌ YAKUBA 1940], and *ambushi* fishermen belonged almost exclusively to the *Sumu-bara* group. A genealogy of this *Sumu-bara* group reveals that *ambushisā* practically form an occupational group.

Around the mid-1930s, seven or eight fishermen were working with their assistants in the *ambushi* fishery. Again, the genealogy of *ambushisā* illustrates that this technique had been employed generationally through this group during the last 100–150 years (Fig. 4).

Also, according to a fisheries survey conducted by the Okinawa Prefectural

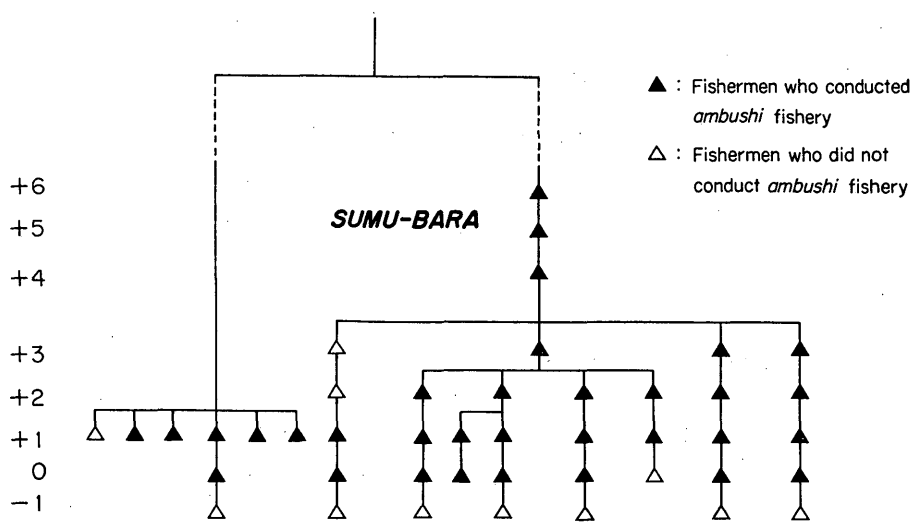


Figure 4. *Ambushi* Fishermen and their Social Relations

Fisheries Experimental Station, in 1929, fifteen *ambushi* groups were based in Itoman [NIHON JŌMIN BUNKA KENKYŪSHO 1956]. Since then, however, the *ambushi* has declined as the young successors of *ambushi* fishermen were urged to engage in the large-scale fish-drive employed during overseas fishing expeditions to Singapore, the Philippines and Indonesia. In the postwar period *ambushi* began again, but the number of fishermen involved has never exceeded five.

Formal Regulations

According to the fisheries regulation rules of 1912, any other fishing or activities in the coastwise area in front of an *ambushi* net, and that might interfere with it, were formally prohibited [NŌRINSHŌ 1938]. This kind of rule was also applied to other types of stationary fishery. Other than this spatial regulation no formal regulations were applied to *ambushi* prior to 1983, when the maximum number of nets that could be operated by an individual fisherman was determined at the General Meeting of the Itoman FCA.

TERRITORIALITY AND REGULATIONS IN AMBUSHI FISHERY

Description

As mentioned above, the *ambushi* fishery has been undertaken for several centuries in the coastal waters of Itoman. Before regulation of the maximum number of nets per capita was made in 1983, the only formal regulation applied to *ambushi* was that on the exclusive use of coastal waters in front of the net. No other rules were applied so long as the fishery was undertaken within the outermost boundaries of a sea territory (*e.g.*, *umi-hō-giri* during feudal times, the Exclusive Fisheries Rights territory after Meiji and the Joint Fisheries Rights territory in the postwar period).

Although these formal regulations offer a clue to the territorial behavior of fishermen, they do not provide an appropriate base for elucidating the practical territorial behavior of fishermen nor do they demonstrate the contents of territoriality. On the contrary, these substantial regulations resided as informal regulations acknowledged only among members of the *ambushi* fishery.

Ambushi-jurī

Sea tenure in the *ambushi* fishery was deliberately organized. It can be simply stated as the system of informal agreements on the use of fishing sites. These agreements were decided on in the meeting among *ambushi* fishermen, *ambushi-jurī* (lit. [*jurī*] "to assemble"). This meeting was called by a senior fisherman and normally held once a year on off-work days during typhoons or stormy periods.

The major purpose of this meeting was to discuss practical issues on use rights, to resolve conflicts, and to maximize and maintain equitable use of the limited sea space. Further, when new fishing spots yielding a good catch were located, discussion on the proper allocation of nets in the corresponding sea area took place. Resultant agreements were recorded in detail by one secretary-fisherman. This

record was kept as the "Rule Book" for the resolution of future conflict. If agreement could not be reached on a dispute, solution was deferred to the next meeting. Participation in an *ambushi-jurī* was voluntary among *ambushisā*, but practically speaking those who could take part as members were limited; successful *ambushi*-fishing requiring long experience and a profound knowledge, so beginners were, in most cases, obliged to give-up within a short period owing to poor catches.

It is not known when the first such meeting was organized, but presumably it was around the late-1890s. It is probable that *ambushi* fishery was most intensively practiced after the invention of water goggles, in that same period. An *ambushi-jurī* has been convened only a few times in the postwar period despite the frequent occurrence of conflict. According to one informant, this is the result of a lack of mutualism among fishermen. Although the meeting has not been called the fishermen still observe rules on territoriality

Several principles and rules are illustrated below, based on information provided by one senior fisherman. Informal acts decided at the meeting are generally called *kimīn* ("to decide"), and cover both general and specific aspects of sea tenure.

Informal Territorial Regulations

Use Rights

As a general rule the first-comer to any fishing spot (*ishiyā*) can claim the corresponding use rights. This principle of "the prior claim" in itself is termed *saki-naishiga-mūn* (lit. "property of those who proclaim"), or *ami-hēte-naran* (lit. "prohibited to set the net in"). In the Yaeyama archipelago of southern Okinawa fishermen call a similar practice *sente-gachi* (lit. *sente* "first-come", *gachi* "to win") [Ruddle and Akimichi n.d.]. It is not a rule peculiar only to *ambushi* fishing but is also widely recognized as self-evident in many different types of fishing. Indeed, to preempt a good fishing ground is the most important and commonest strategy employed to secure a larger catch than other fishermen. In Itoman, when fishermen rush to the fishing ground to scoop rabbitfish fingerlings in the summer season [*cf.* Johannes 1978b], prior occupancy rights are admitted as an unwritten rule; the first to discover a fish school has the right to set the net. This should, however, not be accepted as a *laissez-faire* principle ungoverned by regulations, but rather as a rigorous order of territorial definition.

However, the concept of prior claim raises the critical question of its effectiveness in reducing competitiveness. If the prior occupancy rule is proper, and if one fisherman happens across another at the same spot, stress might escalate into aggressive behavior. If an unskillful fisherman follows a skilled one in order to steal his knowledge, and tries to fish at the same spot, conflict may arise. Thus these rules do not always compromise fishermen's "egocentrism," nor do they afford a satisfactory basis for territoriality.

Reserving Territory

The prior occupancy claim in *ambushi* fishery is not enforced by a fisherman's

occupancy of a certain spot at the time of fishing. Rather it is done on the day before. After fishing a fisherman could set bamboo or wooden poles (*bōwīn*) at the spot where he planned to fish next day. Usually, one or two sites are thus reserved. A round stone with a hole through it is fixed to the pole, or a piece of cloth is attached to the pole, as a fisherman's identification. This practise was valid in any spot available for *ambushi*. In contrast, to reserve any spot for the following day before conducting a day's fishing was strictly banned. In that way competiveness and stress over preemption were reduced in advance, and a man could go to the reserved sea space without anticipating any conflict with others.

This sea-mark has no validity in limiting access of fishermen undertaking other types of fishing (*e.g.*, *pantatakā* fish drive, fixed netting, gill netting, and so forth), since no agreements are established among them. However, since the *ambushi* sea-mark is detected by other fishermen, and henceforth secrecy is lost, it might enhance competition between fishermen using similar techniques. This issue will be discussed below.

CONVENTIONAL SMALL TERRITORY

In general, a particular *ishiyā* is not always independently "possessed," but rather a few spots are regarded as identical in terms of prior occupancy rights. In other words, a defined territory includes from one to five fishing spots. Generally, such a territory is termed *tīchi* (lit. "a unit" or "one"), and is also given a particular name, such as *Inuyā-bara, Nagōji-bara*, and the like (lit. [*bara*] "plain, field").

For example, sites 151, 152, 153 and 154 are individually named *ishiyā*, and the

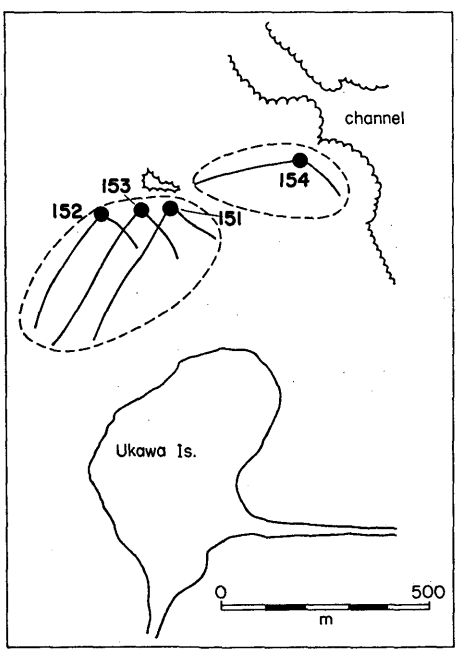
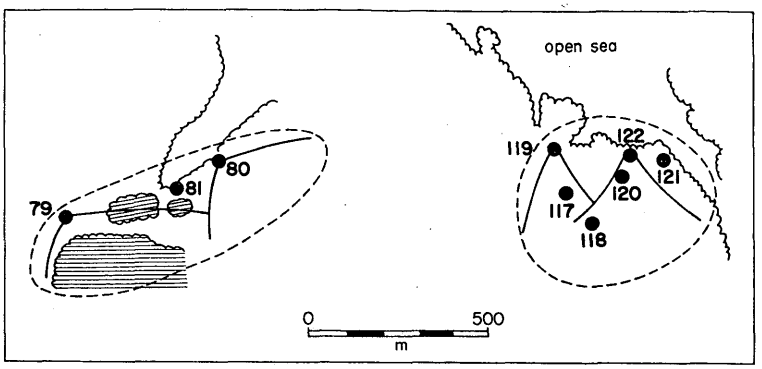


Figure 5–1. Conventional Small-Sized Territory



Figures 5–2, 5–3. Conventional Medium-Sized Territory

areas covered by site 151, 152 and 153 and site 154 form two independent territories (Fig. 5-1). Once a fisherman claims site 151, for instance, no other fishermen can use site 152 and 153, belonging to the same territory as site 151. Alternatively, they or he can choose the separate territory of site 154. Agreements on this kind of exclusive territoriality characterize the basic sea tenure system in *ambushi*. We can designate this as a "conventional small territory." Distribution of these territories is illustrated in Figure 7.

CONVENTIONAL MEDIUM-SIZED TERRITORY

Although exceptional there are a few cases that permit two fishermen to conduct *ambushi* separately within the same territory. Sites 79, 80 and 81 comprise a territory and the corresponding prior occupancy rule is applied. However, even if one fisherman claims site 80, another can also spread his net as far as the point where his wing net reaches a wing net spread from site 80 (Fig. 5-2). The other example is a territory shared by six *ishiyā* (*e.g.*, sites 117–122). Even when one fisherman claims either site 121 or 122, another fisherman could set net at sites 117 or 119, and, further, he can spread the wing net as far as the crossing point with that spread from site 121 or 122 (Fig. 5-3).

These two examples suggest that even within the same territory space-sharing is often allowed so long as a given territory is wide enough to separate two nets. We may call this a "conventional medium-sized territory."

AVOIDANCE OF NET CROSSING

1) One-sided concession

The preceding rules do not always suffice, since a wing net often tends to penetrate the neighboring territory, which might be occupied by another fisherman. In such a case, crossing of two wing nets, both from territories I and II, induces tension and often escalates into conflict. To avoid this the proper arrangement of wing nets is indispensable. Figure 5-4, assumes that fisherman X occupies site 8 in advance (proclaiming territory I) and fisherman Y works site 9 in territory II. Y cannot extend a wing net beyond that spread by X. In other words, the outer edge of a wing net of Y should be spread as far as the crossing point of X's wing net. To properly

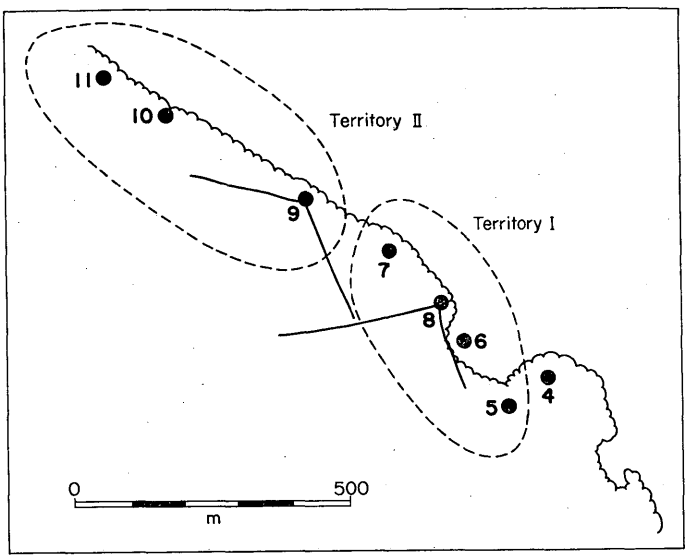
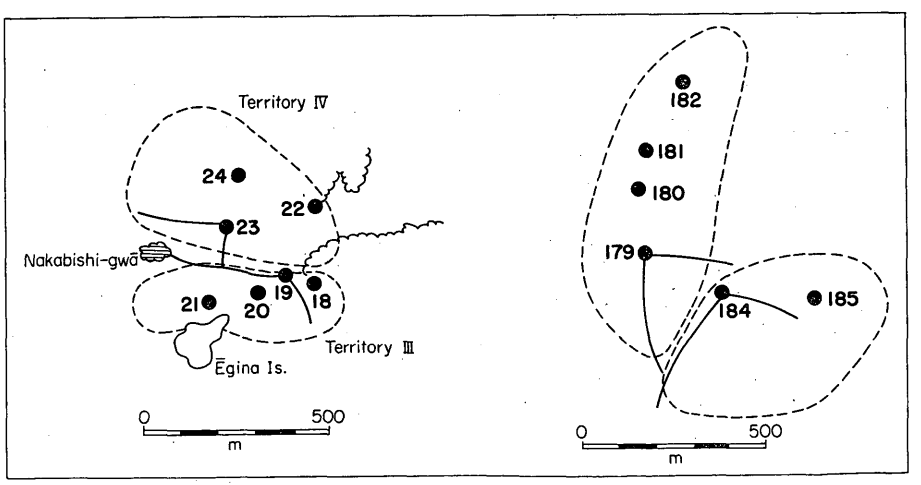


Figure 5–4. Avoidance of Net Crossing

allocate one's wing nets with reference to those of another is locally called *chikīn*.

Sometimes, a certain spot or coral rock is appointed as the mark that serves to specify the direction of a wing net. Figure 5-5 shows an example of this. In Figure 5-5 sites 18, 19, 20 and 21, and 22, 23 and 24 are included in territory III and IV, respectively. The only problem between these two territories is the direction of a left wing net from territory III. At their meeting fishermen reached the agreement that the direction of a wing net spread from territory III should not extend westward beyond the *Nakabishi-gwā* (a reef called *Nakabishi*).

Similar cases also occur elsewhere. Sites 179–182 and 184 and 185 comprise



Figures 5–5, 5–6. Avoidance of Net Crossing

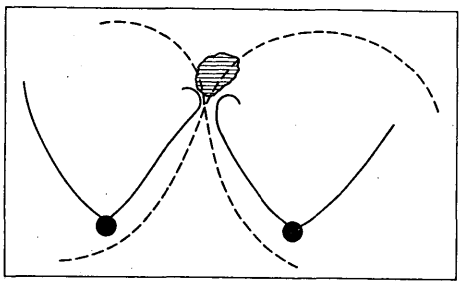


Figure 5–7. Mutual Concession

two independent territories. If either 184 or 185 is occupied, one end of a wing net from either sites 179 or 180 should be subject to the boundary made by the wing net from sites 184 or 185 (Fig. 5-6). Hence, this sort of rule is enforced between two neighboring territories. In fact, the *raison d'être* of this kind of agreement implies that trespass was very likely to occur in productive fishing areas.

2) Mutual concession

One of the striking measures in the *ambushi* fishery to afford maximum opportunity for fishermen to exploit an adjacent area is the rule that the end of the wing net must be bent (Fig. 5-7). When a first-comer permits a later man to spread his net in the adjacent territory, both fishermen concede by inflecting the wing of their nets, at such particular spots as reefs and abysses in the lagoon. This practise of mutual concession is called *ēmagi*, which seems to be of importance in avoiding contact.

PROHIBITION

Occasionally, the use of certain sites is prohibited. Apparently, the spread net not only intercepts activities of fishermen in the neighborhood, but also takes fish in advance as they retreat from shallow to deep waters. In Figure 5-8, sites 14, 15, 16 and 17 form a territory (V), and when poles are found in any of these four sites a newcomer cannot claim site 13, as the occupancy of site 13 inevitably reduces the catch in territory V. It should be noted that site 12, although both site 12 and 13 share the same territory (VI), can be claimed even when sites 14, 15, 16 or 17 have been occupied in advance.

NON-INTERFERENCE

As we have seen, the principle of prior occupancy is first enforced before fishing begins at a certain spot. This then automatically creates an exclusive, wider territory. The prior occupancy rule also governs different cases. Some areas are less exploited during the course of a year by any fishermen and no *ad hoc* agreements, rules and territoriality are claimed. This is partly the result of the ineffectiveness of *ambushi* around the surf break and reef front (see sites 27, 28, 29, 30, for instance) (Fig. 5–9), and partly owing to the ecological reason that these sites are not regarded as good fishing grounds for *ambushi*, but rather for a small-scale fish drive (*pantatakā*). Fishermen call such a situation where no rules are applied, *kimiiteukan* (lit. "not to regulate or agree").

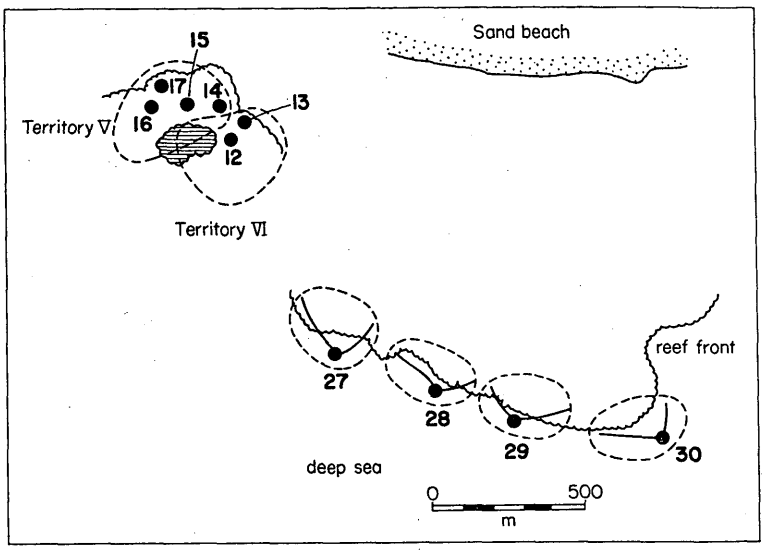


Figure 5–8. (u.) Prohibition of Net Crossing **Figure 5–9.** (l.) Independent Territory

PERMISSION

In most cases, proclamation of territory is implicitly acknowledged. However, the following two examples show that the permission rule is applied on exceptional occasions. When either site 103, 104 or 105 is already occupied, any fisherman wishing to use either site 106, 107 or 108, which belong to the same territory, is required to seek the permission (*sōdan*: lit. "to discuss") of the fisherman in the neighboring territory. Similarly, when territory P, which involves sites 103, 104

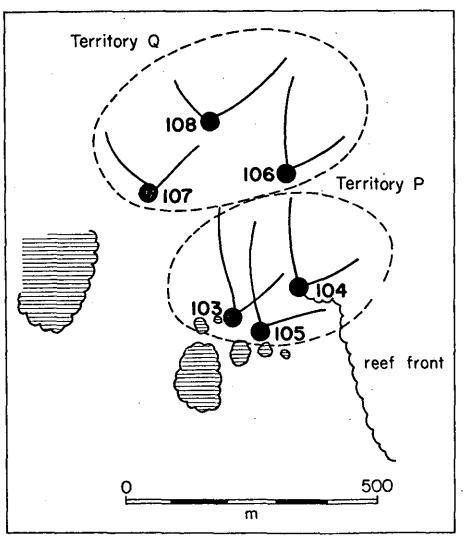


Figure 5–10. Permission and Net Setting

Table 2. Types of Sea Tenure in *Ambushi* Fishing

Type of principle		Number of Cases	
Conventional territory which is composed of			52
	a single fishing site	6	
	two sites	18	
	three sites	17	
	four sites	7	
	five sites	3	
	six sites	1	
Avoidance of net crossing between two fishermen			23
	within a territory	3	
	between two territories	20	
Regulation on net boundary between neighboring territories, appointing coral rocks as a marker			5
Prohibition on use of certain territory under the occupation of the neighboring territory			3
Approval of use of certain territory under the occupation of the neighboring territory			2
Free-use or non-interference because:			36
	no value for *ambushi* fishing	7	
	inefficiency (reef front)	29	

and 105, is staked, any fisherman who tries to utilize territory Q, comprising sites 106, 107 and 108, must first ask permission (Fig. 5-10).

OPTIONAL CHOICE

It should be noted that any fisherman has two options when someone has already staked a given territory. First, he is obliged to leave the territory by accepting silent priority rules, or second, given that the territory is wide enough to allow another fisherman to enter, he can ask permission of the first-comer.

From the examples and principles described above, it is apparent that the sea space for *ambushi* fishery is deliberately divided into numerous territories (*tīchi*), which function to reduce stress and conflict among fishermen. Additional rules attached to each territory serve the same function. A summary of the number of territories and specific areas where complementary rules are applied is shown in Table 2.

Territoriality appears to be one of the dominant factors in sea tenure, judging from this figure. Although free-access areas lacking regulation have only a minor role in the sea tenure system, on the one hand, strict prohibition rules and fairly moderate approval among fishermen prescribe the nature of sea tenure at the other extreme.

These findings suggest important notions for territorial regulation in fisheries. Space-sharing mechanisms involved in even one type of fishing are revealed as complex and diverse, showing the multifacetedness of human territorial behavior for retaining minimum spacing between fishermen [*cf.* PETERSON 1975], avoiding conflicts

within a descent-oriented small occupational group, although prior claim to the fishing spot and the concession rule often call for morality and an ethical code. Hence, inquiries into the basis of formal or macro-level regulation, such as most policy-makers and formalists make, do not alone yield a satisfactory understanding of the territorial behavior of fishermen.

TERRITORIALITY IN ECOLOGICAL AND SOCIOLOGICAL PERSPECTIVE

Trends in Space-Use

FREQUENCY AND EFFICIENCY IN SPACE-USE

The more than two hundred spots utilized in *ambushi* fishery do not all have the same potential as fishing grounds. Informal agreements on space-use suggest that there may be great differences in potential yields, depending on fishing spot and season. Creation of territorial rights also requires special attention if there is a significant difference in yields of individual *ishiyā* within a single territory (*tīchi*). To understand the ecological bases of the informal regulations in *ambushi* fishery, a diary kept by 52 year-old fisherman was studied. Almost two years' data (from Sep 30, 1980 to Sep 17, 1982) was thereby obtained on the daily fishing activities of this fisherman. In his diary fishing sites (*ishiyā*) used as well as the amount and kind of catch taken are described. These data were computed for the following analysis. The results are summarized below:

(1) Total number of fishing days *per annum* is 199 (64.6%) of 308 days (Sep 30, 1980–Aug 3, 1981), and 226 (67.7%) of 334 days (Oct 18, 1981–Sep 17, 1982). This supports the idea that fishermen work as much as possible, although seasonal fluctuation of fishing effort exists. During the winter season (December through March) 71 of 121 days, both in 1980 and 1981, were off-days, whereas during the most productive season (April through May) only one and five days, respectively, were spent resting in the two years;

(2) The use frequency of each fishing spot varies conspicuously, and it seems to exhibit either a Poisson or exponential distribution. Fishing spots exploited once a year are the most in number, and the frequency decreases as use frequency increases. More than 60 percent of the fishing spots were used less than three times a year whereas those utilized over 15 times accounted for only 5 percent. No statistically significant difference was found between the two years' distributions, by applying the Kolmogorov-Smirnov test ($\chi^2=2.835$) (Fig. 6);

(3) Frequency in the use of individual territory was examined. Since one territory includes more than one fishing spot, some were used more than 20 times a year, whereas territories used less than four times still comprise more than 50 percent of the total;

(4) Yields per haul vary considerably from null to over 156 kg ($\bar{x}=23.6$, $s=27.71$, $n=296$, for 1980–81, $\bar{x}=18.5$, $s=16.33$, $n=424$, for 1981–82); and

(5) Fishing spots were ranked into five classes according to use frequency (I[1–4 times/yr.], II [5–9 times/yr.], III [10–14 times/yr.], IV [15–19 times/yr.] and V [over

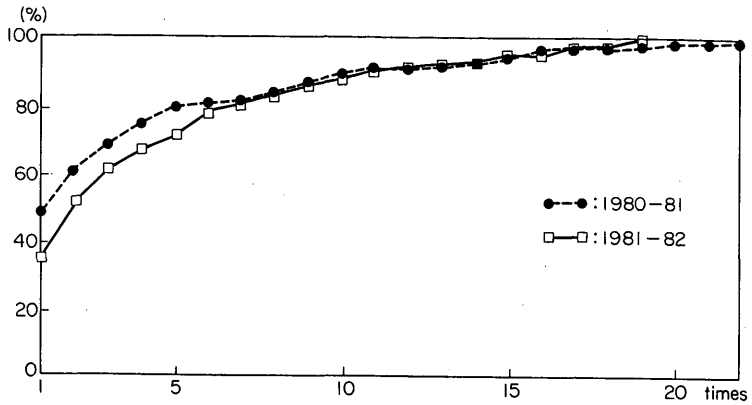


Figure 6. Cumulative Frequency in Use of Fishing Spots

20 times/yr.]). Generally, particular trends in yields according to use frequency were not found in 1980–81 ($F=1.507$), but in 1981–82 a statistical significance was detected between frequency and yield ($F=2.907$, $p<0.05$), by Welch's method.

Overall, the data suggest that there exist unpredictable trends in yields. If so, what is the cause of the differential use of space? And how is space-use related to the ecological diversity of fishing grounds on the one hand and to the territorial behavior of fishermen on the other?

POTENTIALS OF FISHING SPOTS

Based on information of two fishermen, X and Y, how fishermen qualify each fishing spot was examined in order of preference rank. This was ranked into five categories; frequently used, commonly used, rarely used, never used, once used but abandoned owing to the lowest catches obtained.

Results were compared with use frequency data of another fisherman, Z. According to the evaluation of fishing spots by X and Y, the correlation, expressed by a contingency coefficient in terms of use frequency, between the two is $C=0.69$ ($\chi^2=175.37$) [SIEGEL 1956]. These qualitative data were compared with actual use patterns of fisherman Z. Evaluation of fishing spots was found to differ among the three; some spots perceived as "the best" were not exploited by fisherman Z, whereas a few spots that had never been used by X and Y were exploited over five times a year by Z. Contingency of use frequency by fisherman Z was examined, based on the five categories of fishermen X and Y. Significant differences were detected ($\chi^2=21.31$, $p<0.001$). However, it is primarily the result of the different perception of rarely used fishing spots ($\chi^2=18.58$). On the other hand, perception of the frequently used fishing spots is similar between X and Y ($\chi^2=0.2$). Fishing spots that were used but abandoned were also similar. In summary, perception and actual use of the fishing spots is generally uniform, except those rarely used, as the latter are greatly affected by environmental constraints.

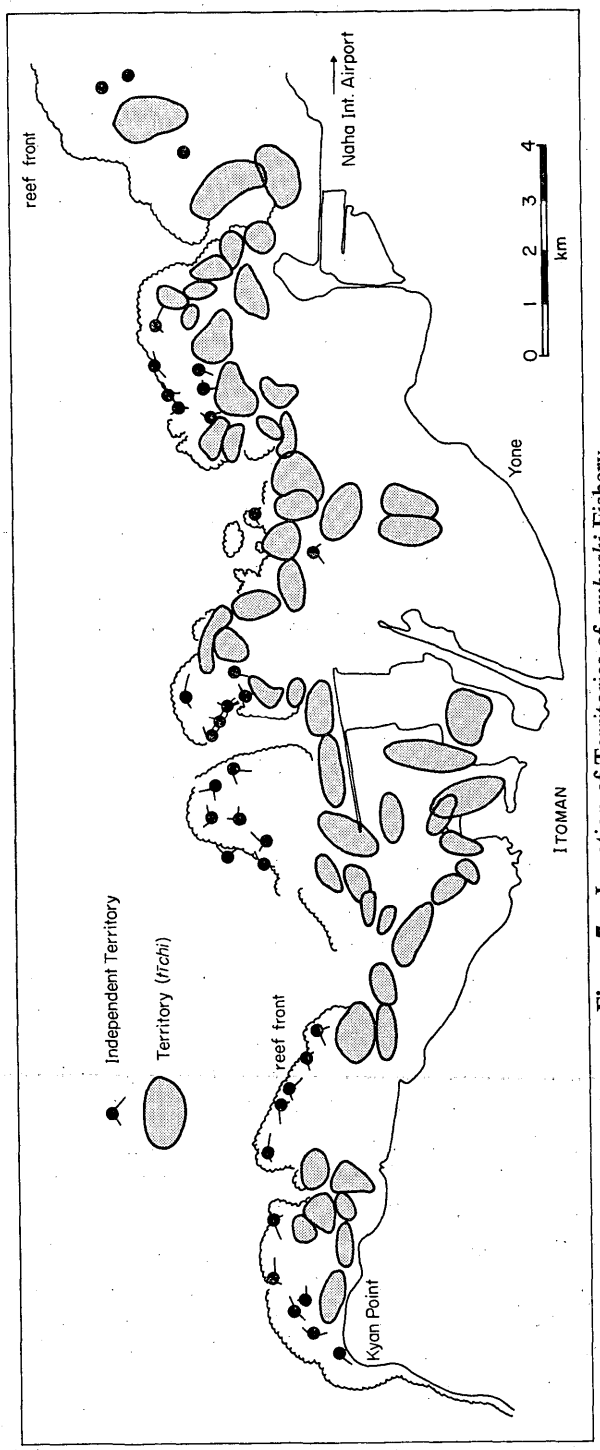


Figure 7. Location of Territories of *ambushi* Fishery

Environmental Factors Influencing Space Use

Typhoon Effect

Winds and waves are one of the major physical environmental factors that limit access and affect efficiency in *ambushi* fishing. Fishermen are often urged to rest during the windy winter season. Even on calm days wave action around reef fronts often reduces the efficiency of activities. This is closely related to the absence of special regulations for them (*vide supra* "non-interference"). Nevertheless, *ambushi* fishery has the advantage that it can be employed all-year in protected shallow waters, unlike deep-sea oriented fish driving techniques. Storms and typhoons are likely

Table 3. Post-Typhoon Fishing
(Three days records after typhoon are described)

Date			Fishing Spot I.D.	No. times of use per year[1)]
1980	Oct	15	65	8
			78	7
	Oct	16	16	11
			18	20
	Oct	17	32	18
			8	11
1980	Nov	09	12	16
	Nov	10	32	18
			76	14
	Nov	11	198	14
			76	14
1981	Apr	24	12	16
	Apr	25	14	4
			121	8
	Apr	26	18	20
			121	8
	Apr	27	112	5
			121	8
1981	Nov	28	12	11
	Nov	30	198	15
			87	12
1982	Jan	06	8	19
	Jan	07	22	15
			18	17
1982	Apr	10	18	17
	Apr	11	22	15
			120	4
	Apr	12	87	12
1982	Aug	16	8	9
			?	9
	Aug	17	11	7
			80	10
	Aug	18	38	17
			147	8

Table Note: 1) Use frequency of the fishing spots differs in the two years: for instance during 1980–81 site 8 was used eight times whereas in 1981–82 the same spot was exploited nineteen times.

to minimize fishing intensity. However, fishermen believe that "post-typhoon fishing" sometimes results in a greater than usual catch. Therefore, to choose potentially highly productive spots is the focus in "post-typhoon fishing," and fishermen used to rush into the rough sea to claim good fishing spots after the passage of a typhoon.

According to the diary examined, certain spots were specifically chosen; site 12 was used for three successive days after a storm (April, 1981), and a total of 393 kg of reef fish was obtained. Site 18 was used a total of eight times in a year, of which five were following typhoons or storms during 1980–82. Generally, sites utilized after typhoons and storms are likely to be frequented by fisherman in other periods of the year as well (Table 3). Given the high rate of return in "post-typhoon fishing" possible causes may be related to either the resultant preservation (*vide infra*) of the sea for a short period of time (usually less than a week or so) or wave action by which fish were driven toward shallow waters.

Only brief information of post-typhoon effects on the fish aggregation towards shallow water is available in the literature, from Cuba. It suggests that certain reef species migrate in turn to specific spots after the passage of a typhoon [ROIG and MUZA 1952].

Unlike typhoons that occur irregularly, such periodic phenomenon as lunar-tidal cycles may afford much more reliable and accumulated knowledge regarding timing and production [CORDELL 1974].

FISH RECOVERY CYCLE

It is generally recognized among fishermen that once any spot is exploited it requires a "resting time" until an exploitable quantity of fish has returned. By experience fishermen memorize locality-specific "resting times" and "preserve the sea" for a certain period of time after exploitation. This strategy is locally termed *umi yukkwasu* (lit. "to give a rest to the sea"). Fishermen believe that a good fishing spot, *ii umi* (lit. "good sea"), gives a constant catch regardless of the frequency of use. It is presumed that more regularly used fishing spots have a potentially fast fish recovery cycle whereas those used less often have a slower one. No statistical differences between intervals of "resting" and use frequency were detected ($F=0.81$ as of 1980–81, $F=0.59$ as of 1981–82) by analysis of variance. The mode of distribution is at less than one week, except for the least used spots (2–4 times/p.a.) where the mode is at over six weeks. However, it was ascertained that most frequently used spots (over 15 times/p.a.) have the shortest intervals of "resting," compared with those less frequently used (for instance, $t=1.77$, $p<0.1$ for 1980–81, $t=2.38$, $p<0.05$ for 1981–82), by Welch's t-test.

"Resting times" are often disturbed by another fisherman who, unobserved, uses the spot. In such a case both fishermen will eventually obtain a smaller catch than expected. Henceforth, a fishing spot used once is either exploited for a few successive days, so long as a good catch lasts, or remains temporarily unexploited.

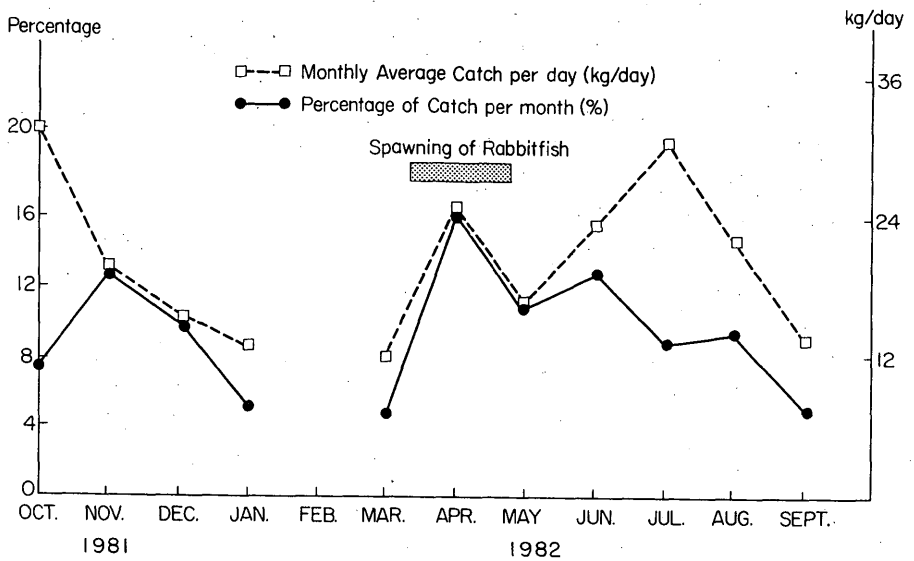


Figure 8. Seasonal Trend in Yields and Average Catch per Day

SPAWNING

Generally, fishermen believe that a good catch is expected during the spawning season. This is particularly true of rabbitfish, *miyagē* (*Siganus fuscescens*), and *kāē* (*S. guttatus*), from mid-March to May. Fishermen believe that most species spawn around these periods [*cf.* JOHANNES 1978b]. Coupled with fishing intensity, yields of fish increase during the spawning season compared with other periods of the year, although average catches per day increase more in July and October than in the spawning season (Fig. 8).

Ambushi fishery was formerly conducted by one fisherman seasonally, during the spawning season of squid. During the period May through July, locally termed *yū-jīki* (lit. "season of fish"), fishermen cannot expect a good catch of squid using a small-scale fish drive, since squid almost disappear. In prewar times there was only one fish drive group, composed of a senior leader and 10–20 young men, but the number of groups increased to four after the war. Since these four groups conducted fish driving all year, without observing any conservation measures, squid yields decreased considerably. This resulted in a shortage of labor for those groups that obtained the lower catches, and consequently three were obliged to give-up fish-driving. This illustrates that the fish driving technique exhausts fish populations whereas *ambushi* is less destructive. Seasonality in spatial allocation of the fishing grounds seems to be less clear. Whether or not it relates to fish ecology should be further examined.

FIXED NETTING AND COMPETITION

A few kinds of small-scale fisheries are conducted off the coastal areas of Itoman, including gill netting, stake netting, fish driving and fixed netting. Of these both

stake netting and fish driving have long co-existed. Three types of fish driving techniques are distinguished: *pantatakā*, *chinakakiyā* and *agiyā*. *Agiyā* is a large-scale technique conducted in deep waters for fusilier and damselfish whereas the other two are done in shallow waters within the reef. *Chinakakiyā* is medium-scale whereas *pantatakā* is small-scale. A variety of reef fishes is taken by these two techniques. In Itoman the *pantatakā* technique is important and is preferably undertaken in coral habitats, whereas stake netting is done in sandy and grassy habitats.

Further, the fish drive is conducted about ten times per day, seeking schools of fish in shallow waters. The stake net, however, is stationary and the gear is set for at least a day or so.

The other two techniques are new to Itoman, and their impact is quite different. The gill net (*sashi-ami*) is not suited to the shallow waters within the lagoon, but rather to the deeper reef crest waters and along the reef edge. These correspond to the daily feeding migration routes of fish [*cf.* AKIMICHI 1978a]. In other words, fishing spots suited for gill netting are not effective for stake netting, and so the former are spatially segregated from the latter.

Fixed netting is hazardous to the stake net fishery. The introduction of the small-scale fixed net fishery (*masu-ami*) to Itoman waters provoked territorial conflicts among the two groups of fishermen. This net was first introduced in the early-1970s and was operated by fishermen from Yone and Kyan, who belong to the Itoman FCA but who are not affiliated with the Itoman fishermen. The fixed net is semi-permanently placed in fishing grounds that are also suitable for *ambushi*. In particular, the more than 20–30 iron poles required for fixing a bag net for the season occupy a sea area semi-permanently. Although no legal basis for rejecting the other fishermen's intrusion exsists, these poles interfere with other nearby activities. The location of fixed nets and poles is indicative of over-crowding, as is shown in Figure 9. The large proportion of juvenile fish taken by fixed netting is also the ecologically hazardous.

A general meeting of the Itoman FCA was called in the summer of 1983 to approve several types of fisheries rights. The maximum number of stake nets per fisherman was discussed. But the meeting had a disadvantageous outcome for the *ambushi* fishermen. The maximum number of nets for both *ambushi* and small-scale fixed nets was set four per fisherman. Whereas *ambushi* fishermen can manage to use only three nets a day at most, working for approximately twelve hours, the fixed netter is favored with a larger catch while spending fewer hours hauling. Although sharing the same FCA membership, *ambushi* fishermen and fixed netters live in two separate communities and oppose each other for the use of the same fishing grounds. No strong social bonds like the *munchū* in the *ambushi* fishermen's group exsist. Ecological and political processes involved in this problem should, however, be examined through follow-up studies [AKIMICHI 1978b].

RECLAMATION

Man-induced modification of the coastal environment has also greatly affected territorial behavior in the *ambushi* fishery. Owing to large-scale land reclamation

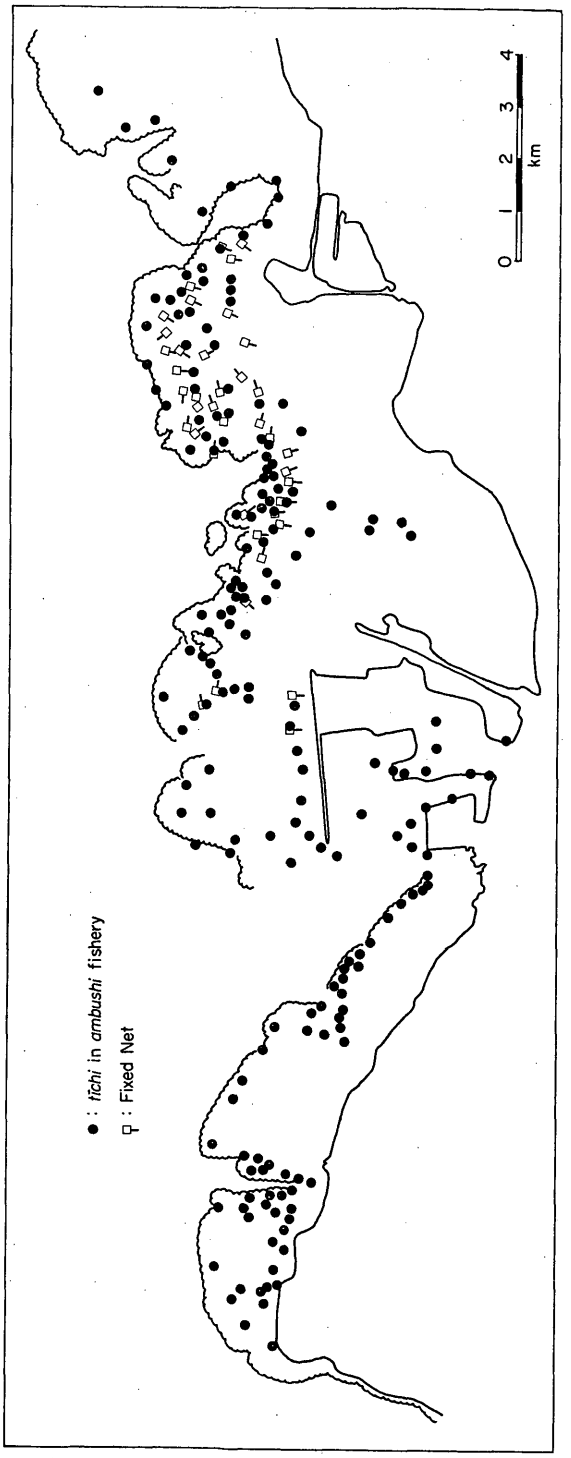


Figure 9. Distribution of *ishiyā* and Fixed Net (*masu-ami*)

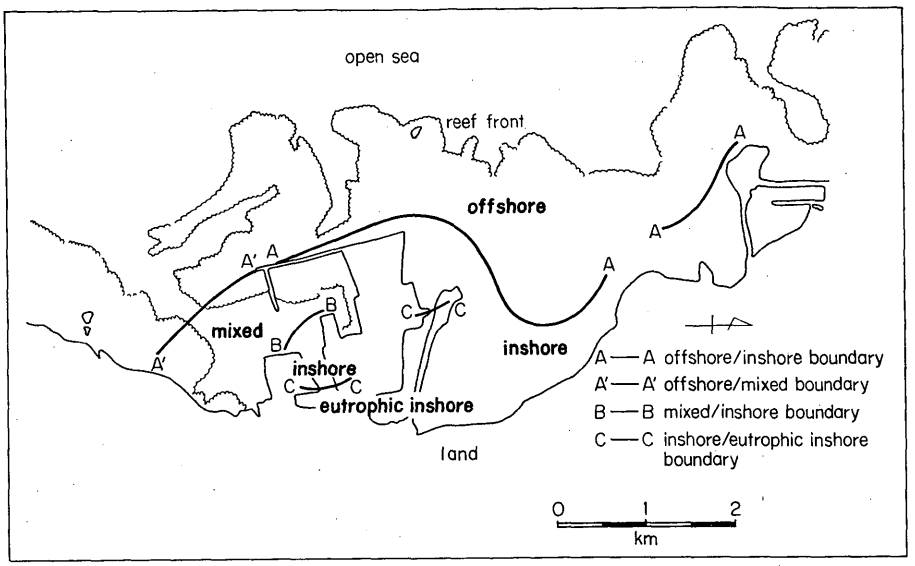


Figure 10. Zonation of Coastal Waters of Itoman
Source: [OKINAWA-KEN and UBE TANKI-DAIGAKU 1981: 25]

since the 1960s, the coastal waters of Itoman have been altered enormously. As a consequence of this, and the destruction of fishing grounds in particular, the number of available fishing spots has drastically diminished. According to an environmental assessment survey made in 1980, the coastal waters of Itoman can be divided into four zones, judging from the biological composition of plankton and

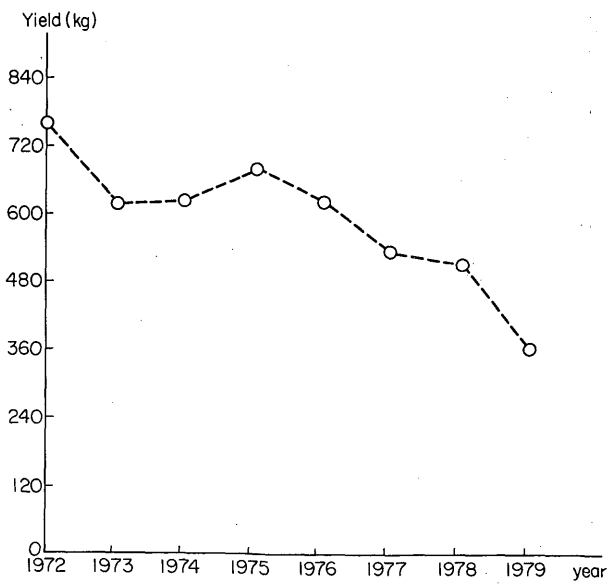


Figure 11. Trend in the Yield of Fish Drive and Stake Net Fisheries

benthos in the area. These are offshore, inshore, mixed (offshore and inshore) and eutrophic inshore zones [OKINAWA-KEN and UBE TANKI-DAIGAKU 1981]. As shown in Fig. 10, lines A, B, and C are the possible ecological boundaries of offshore, inshore and eutrophic zones. Though data are not available on the distribution of coastal biota before the start of large-scale reclamation, both lines A and B must have been nearer the coast than at present, and line C might have been confined to a small area.

Eight years of catch records (1972–1979) for one fishermen who conducted both stake netting and fish driving show that there has been an apparent decline in yields per day during the last 5–6 years (Fig. 11).

Ecology and Territoriality

Judging from the present findings on the use of fishing spots, creation of territory in *ambushi* fishery was the adaptive measure of sea tenure applied for both conflict resolution and resource conservation.

Such environmental constraints as typhoons and the fish recovery cycle primarily give ecological bases to the informal regulations on territoriality in terms of space and time factors in fishing activities. That knowledge of good fishing spots appears to be shared quite uniformly among fishermen is related to the group membership composition of fishermen. In other words, the strong social bonding of *munchū* also enabled fishermen to informally create sea tenure regulations. Both ecological and social factors are the bases of territoriality in *ambushi* fishery.

However, land reclamation and the introduction of a fixed net fishery have not only reduced possible fishing areas for *ambushi* fishery but also the number of fishermen who can catch enough fish to sustain a livelihood. Decrease in the number of fishermen might first make it likely that informal regulations would fall into disuse, but owing to over-crowding induced by the fixed net fishery a need has arisen for alternative regulations. The formal regulations on the maximum number of nets, made in the summer of 1983, unexpectedly served to undermine the harmony of ecology and social structure.

CONCLUSION

Concepts, processes and the implementation of territoriality in a small-scale fishery have been described, focussing on the stake net fishery of Itoman, Okinawa Prefecture.

At the macro-level, historically stratified maritime institutions, such as village-based *umi-hō-giri*, entry rights, exclusive fisheries rights and communal fisheries rights, profile the formal aspect of territoriality, whereas at the micro-level, through such measures as prior occupation claims, conventional territory, concession, negotiation and prohibition, practical territorial behavior is informally regulated.

Such environmental factors as winds, waves, spawning season, and, *inter alia*, fish recovery cycles, provide the ecological bases for informal regulations in the

stake net fishery. In addition, socio-economic consequences have moulded these ecological premises. Emergence, establishment and decline of the territory in *ambushi* fishery in Itoman can be interpreted as the disparity process of ecology and social structure in a fishing community. The study of informal regulations in the territorial behavior in a small-scale fishery is indispensable to an understanding of maritime institutions as a system of man's adaptation to the marine environment.

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APPENDIX I. ALPHABETICAL LIST OF FISH NAMES TAKEN BY *AMBUSHI* FISHING

Vernacular Name	English Common Name	Scientific Name
Fish		
abasā	Porcupinefish	*Diodon* spp.
akamurū	Goatfish	*Mulloidichthys* spp.
akangigwa	Emperor (juvenile)	*Lethrinus choerorhynchus*
amaiyu	Silver Biddy	*Gerres macrosoma*
burā	Mullet	*Mugil* & *Liza* spp.
chin	Porgy	*Acanthopagrus sivicolus*
chinuman	Unicornfish	*Naso unicornis*
darumā	Sea-Bream	*Monotaxis grandoculis*
*ēgwa**	Rabbitfish	*Siganus fuscescens*
fūruyā	Goatfish	*Mulloidichthys flavolineatus* & *M. vanicolensis*
gāra	Trevally	Carangidae
haiyū	Halfbeaks	*Hemirhamphus* spp.
hanabukkuwā	Rabbitfish	*Siganus spinus*
hararā	Needlefish	*Strongylura* spp.
henza	Rays	Rajiformes
hitsū	Drummer	*Girella* & *Kyphosus* spp.
ikibūya	Bullseye	*Priacanthus* spp.
irabucha	Parrotfish	Scaridae
*jinbā**	Goatfish	*Parupeneus* spp.
kāe	Rabbitfish	*Siganus guttatus*
kāsā	Coralfish	Chaetodontidae
kamasā	Barracuda	*Sphyraena* spp.
katakashi	Goatfish	*Parupeneus* spp.
kisu	Whiting	*Sillago* spp.
kuchinagi	Emperor	*Lethrinus ornatus*
kurē	Sweetlips	*Plectorhynchus* spp.
kurushibitsu	Girellas	*Girella* spp.
kusuku	Surgeonfish	*Acanthurus* & *Zebrasoma* spp.
mānukkugwa	Emperor (mature)	*Lethrinus choerorhynchus*
mībai	Grouper	*Epinephelus* spp.
muchigwa	Sea-Bream	*Gymnocranius* spp.
murū	Emperor	*Lethrinus* spp.
ōnrē	Rabbitfish	*Siganus javus*
oyabikā	Damselfish	*Abdefduf* & *Chromis* spp.
sāpu	Ponyfish	*Leiognathus fasciatus*
shiruiyū	Sea-Bream	*Gymnocranius* & *Gnathodentex* spp.
taman	Emperor (mature)	*Lethrinus choerorhynchus*
tinmū	Porgy	*Acanthopagrus* spp.
tūnukkwa	Conger Eel	*Conger* spp.
turubai (*jinbā*)	Goatfish	*Upeneus tragula*
yamatobā	Sea-Perch	*Lutjanus russelli*
yūaka (*jinbā*)	Goatfish	*Parupeneus fraterculus*
Invertebrates & Reptile		
akaika	Squid	*Sepioteuthis lessoniana* (female)
shiroika	Squid	*Sepioteuthis lessoniana* (male)
kubushimi	Cuttlefish	*Sepia* spp.
kani	Crab	*Scyllia* spp.
kāmī	Green sea turtle	*Chelonia mydas*

Appendix Note: *refers to generic name.