

# Gaed long ol toksave blong ol fising komiuniti long Vanuatu



Pacific  
Community  
Communauté  
du Pacifique

The Locally-Managed Marine Area (LMMA) Network



Improving the practice of marine conservation



UNION EUROPÉENNE

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# Gaed long ol toksave

## long fiseris manejmen blong ol komiunitis

Gaed ia hemi introdiusim olgeta toksave long ol impoten grup blong ol spisis blong solwota we yumi yusum olsem kakae long ol aelan blong Pasifik. Toksave ia the Pacific Community (SPC – [www.spc.int](http://www.spc.int)) i bin wok wetem Locally-Managed Marine Area Network (LMMA) ([www.lmmnetwork.org](http://www.lmmnetwork.org)) blong prodiusim.

Papos blong ol toksave ia hemi blong helpem ol komiunitis mo pipol we oli wok wetem olgeta blong provaedem infomesen long ol spisis we olgeta i gat intres long olgeta mo advaes long ol stret fiseris manejmen opsens we olgeta oli save jusum blong yusum. Fiseris manejmen we i bes long komiuniti fiseris hemi involvem fising komiuniti blong tekem men rol long manejmen blong fiseris risos we olgeta i dipen long hem long saed blong sikiuriti blong kakae mo semtaem fasin blong winim mani. Blong mekem hemia, ol komiuniti oli nidim ol teknikol infomesen mo advaes long ol spisis blong risos we oli stap yusum.

### GAED IA HEMI GAT OLGETA SEKSENS OLSEM:

1. Pepa blong toksave we i stap rere blong yusum
2. Olgeta fis long ol fiseris klosap long so long ol aelan blong Pasifik
3. Ol fasin blong fis klosap long so mo ol tul blong fising
4. Manejmen blong fiseris tru long ol komiunitis
5. Ol fasin blong manejem fiseris
6. Ol marin risev we komiuniti i manejem o ol taberia we ol man i no save tekem fis aot long olgeta
7. Ol toktok we i save gohed insaed long ol fising komiuniti
8. Ol toktok we yumi yusum long fiseris wanem nao oli minim





# 1 Ol pepa blong toksave we i gat i stap finis

Ol pepa blong toksave we oli listim long ol namba daon ia oli provaedem infomesen long ol impoten spisis blong solwota mo ples we oli stap long hem we yumi save faenem long ol aelan blong Pasifik. Wanwan pepa i givim infomesen long wan spisis mo ples we hemi stap long hem mo ol difren fasin blong manejmen we yumi save jusum. Ol 29 pepa blong toksave ia i stap finis long the Pacific Community (SPC) mo ol nara

pepa oli SPC save mekem folem rikwes. Gaed ia i mas stap sef oltaem blong yusum naoia mo blong yusum olsem refrens long fuija, taem yumi yusum ol pepa blong toksave ia.

Ol pepa blong toksave ia wok blong olgeta i no blong helpem yu blong luksave ol defren kind spisis; i gat sam long ol nasonal, FAO mo SPC publikesen we oli stap blong yusum from pepos ia.

Fis we i gat fin	Animol we i no gat bun long bak
1. <b>Los</b> (Epinephelidae)	9. <b>Besdemea/Si-kukumba</b> (Holothurians)
2. <b>Piko</b> (Siganidae)	10. <b>Natalae</b> (Tridacnidae)
3. <b>Redmaot</b> (Lethrinidae)	11. <b>Troka</b> ( <i>Tectus niloticus</i> )
4. <b>Blufis</b> (Scaridae)	12. <b>Krab Kaledoni</b> ( <i>Scylla serrata</i> )
5. <b>Rif snapa</b> (Lutjanidae)	13. <b>Naora blong solwota</b> (Palinuridae)
6. <b>Karong</b> (Carangidae)	14. <b>Krab kokonas</b> ( <i>Birgus latro</i> )
7. <b>Malet</b> (Mugilidae)	15. <b>Nawita</b>
8. <b>Poketnaef fis</b> (Acanthuridae)	16. <b>Grin snel</b> ( <i>Turbo marmoratus</i> )
17. <b>Sak blong rif</b>	19. <b>Si ejen</b>
18. <b>Stingre mo flat bodi fish</b>	20. <b>Posen stafis</b> ( <i>Acanthaster planci</i> )
	21. <b>Flat naora blong solwota</b> (Scyllaridae)
	22. <b>Kokias</b> ( <i>Anadara</i> sp.)

## Ol narawan

23. Ol si wid we man i save kakae	27. Niutrien mo sedimen
24. Spawning aggregations	28. Ol nalumllum we i save spoelem ol animol blong solwota ...
25. Ol natongtong	29. Fis we i kakae ol plant
26. Ol si gras	



## 2 Ol fis long ol fiseris klosap long so long ol aelan blong Pasifik

Ei gat 200 go kasem 300 spisis blong fis we oli stap kasem long ol eria klosap long so long ol aelan blong Pasifik. Tebel we i stap daon (aot long Dalzell mo Schug, 20021) i soem stret kaen fis we oli kasem evri taem long 15 ples long wes

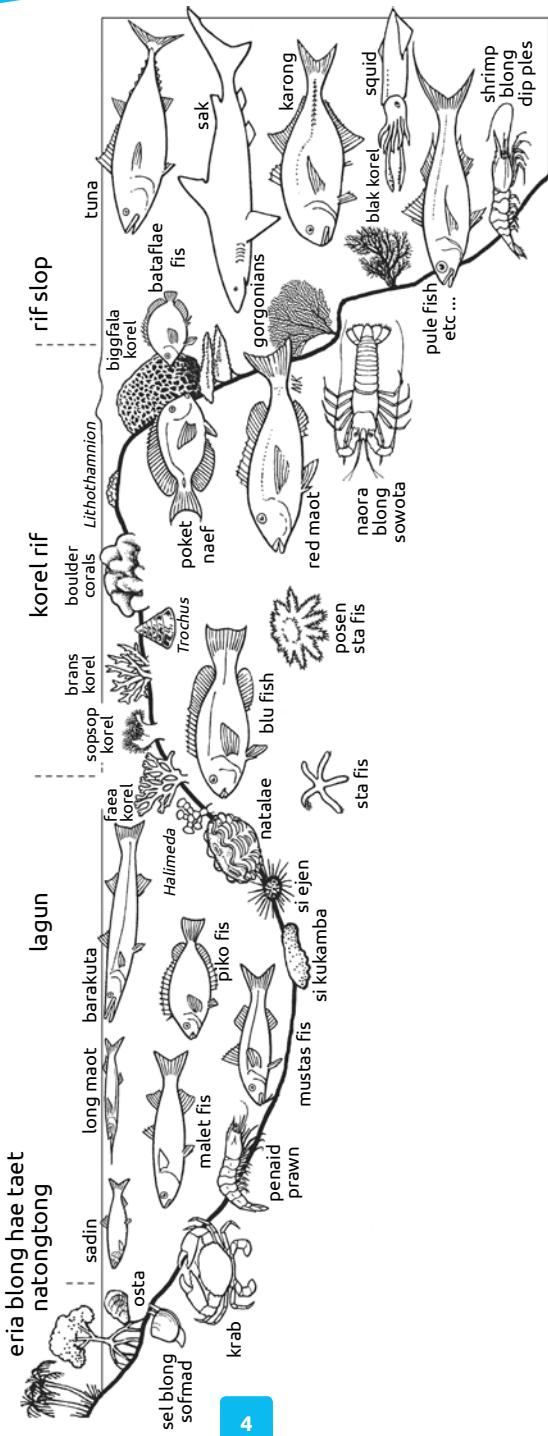
mo sentrol eria blong Pasifik. Klosap evri namba tri fis blong total blong ol fis ia we oli kasem oli redmaot (Lethrinidae), poketnaef fis (Acanthuridae) mo rif snapa (Lutjanidae).

Common name	Family name	Percentage
Redmaot	Lethrinidae	13.32
Poketnaef fis	Acanthuridae	10.91
Rif snapa	Lutjanidae	9.19
Karong	Carangidae	7.19
Los	Epinephelidae	6.96
Malet	Mugilidae	6.90
Blufis	Scaridae	6.58
Tuna/manggru	Scombridae	5.53
Mustasfis	Mullidae	3.25
Piko	Siganidae	2.92
Redfis blo rif	Holocentridae	2.69
Barakuta	Sphyraenidae	1.53
Bunfis	Albulidae	1.36
Grunts	Haemulidae	0.89
Longmaot	Belonidae	0.81
Strongskin	Balistidae	0.74
Napoliong	Labridae	0.52
Mojarras	Gerridae	0.49
Longmaot	Hemiramphidae	0.17
Melekfis	Chanidae	0.15
Surf perches	Theraponidae	0.03
Ol narawan		17.87

<sup>1</sup> Dalzell P. and Schug D. 2002. Synopsis of information relating to sustainable coastal fisheries. Technical Report 2002/04. International Waters Programme, Programme régional océanien pour l'environnement (PROE), Apia, Samoa.



## Profael blong wan lagun mo baria rif sistem sam long ol spisis we i stap long hem





## 3 Ol fasin mo tuls blong fising mo klosap long so

I gat plante kaen blong tul blong fising we oli yusum long ol fising komiunitis mo oli diskraebem sam long olgeta men wan long seksen ia.

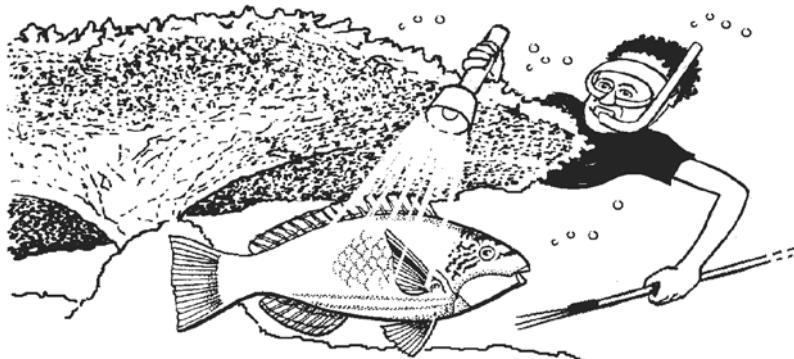
### KAREM RISOS LONG RIF

Karem ol animol mo ol si wid blong solwota long lagun o long rif taem solwota i drae hemi wan kaen aktiviti we yumi stap mekem evri taem, eespeseli ol mama mo ol pikinini. I gat plante kaen animol blong solwota we oli stap karem long fasin ia, olsem si-kukamba, si ejen, krab, snel blong solwota, si wid, namarae, smol fis, wom, naggalat blong solwota mo nawita.

Naora oli stap kolektem antap long rif long naet. Blong karem ol samting ia, yumi save yusum han, sam long olgeta yumi mas digim insaed long sanbij o sofmad wetem leg, sam yumi kapsaetem ston o korel o brekem korel, mo yusum stik mo huk blong pulum nawita, krab o fis aot long hol insaed long rif. Taem yumi stap mekem ol kaen fasin ia samtaem yumi karem smol amaoon blong kakae nomo be damej long rif mo long laef blong solwota i save bigwan tumas.

### YUSUM SPIA

I gat ol difren kaen wei we yumi stap yusum spia long hem, olsem antap mo insaed long solwota. Yu save yusum spia taem yu stap long saed blong solwota o taem yu stap long wan bot o yu stap daeva andanit long wota wetem masket blong daeva. Ol fisa oli stap yusum toslaet mo spia long naet blong kasem fis taem solwota i drae. Ol yus blo ol niu kaen tul, olsem toslaet we yu save yusum andanit long wota, i gat bigfala ifek long sam long ol laef blong solwota we i stap klosap lo so. Sam long ol bigfala fis, olsem blufis, oli slip olbaot long korel long naet blong protektem olgeta long ol nara kaen fis we i save kakae olgeta, mekem se i isi tumas blong wan man i save kasem olgeta wetem toslaet mo masket blo daeva. Glas blo daeva, fin, tul blong SCUBA, aean spia mo masket blong daeva i inkrisim sakeses blong kasem fis wetem spia.

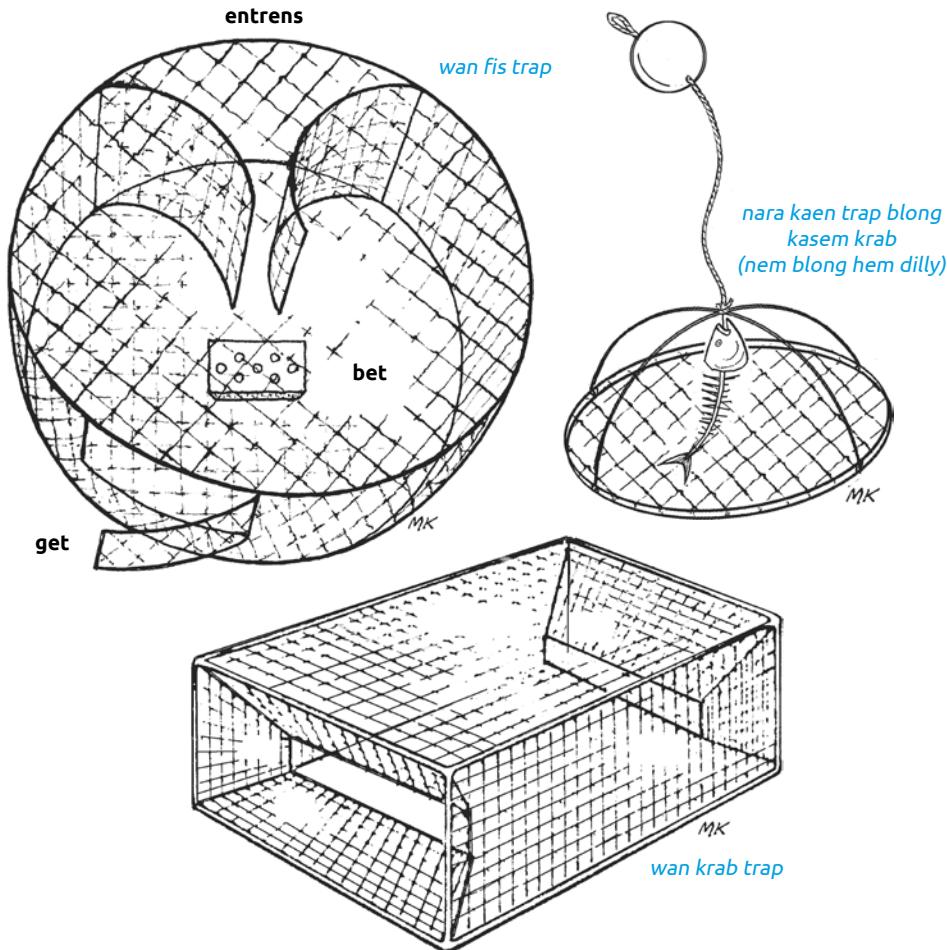




## OL TRAP WE YU SAVE MUV RAON WETEM

Ol trap we oli mekem wetem waelken, bambu mo wud blong natongtong oli stap yusum truaot long Pasifik long plante handred yia finis. Yus blong ol materiel blong tedei, olsem net we oli mekem wetem naelon mo net blong waea, i mekem trap i isi blong bildim mo yus blong hem i spredaat bigwan. Stampa tingting blong trap we i gat

bet hem i se ol animol we oli luk trap ia mo oli wantem tekem bet ia, oli go insaed long trap ia tru long wan do we i bigwan long afsaed mo smolsmol long insaed, mekem se i had blong ol animol we oli stap insaed long trap ia blong ronwe. Bet trap o pot oli stap yusum blong kasem krab mo ol nara kaen fis we oli kakae mit.

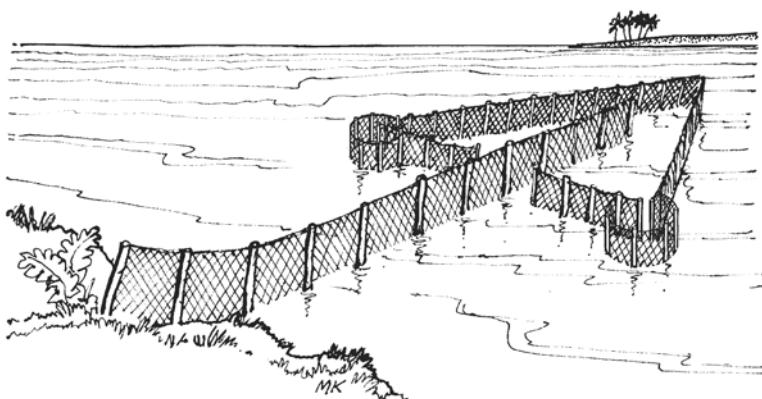




## TRAP WETEM WOL MO FANIS

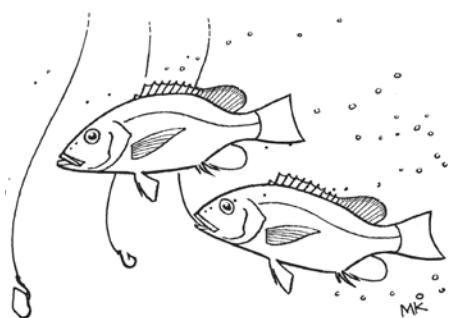
Wan trap wetem wol mo fanis hemi wan long ol olfala wei blong komiuniti i kasem fis. Hemi wan isi tradisinol trap we oli stap yusum taem solwota i drae blong blokem fis insaed long ol wol blong ston o korel we i stap olsem leta V o long haf sekel. Oli save putum wan net long ples we rif i open blong kasem ol fis taem oli wantem go bak long dip wota taem we solwota istat blong drae. Long ol fanis trap i gat wan fanis or wan wol we oli bildim long raeft ankel long laen blong so o long rif blong blokem ol fis we oli stap muv i go tugeta long

wan ples we i blok istap. Taem we fis i kasem fanis oli swim folem fanis go kasem ples we i blok istap mo oli no save ronwe long hem. Ol fasin blong mekem fanis ia oli folem kastom blong olgeta mo oli defren long ol defren ples. Long long taem bifo oli stap mekem fanis ia long ston be naoia oli save mekem wetem ol materiel blong tedei olsem net waea. From i no hadwok blong oli mekem mo from plante man i stap mekem olsem i minim se i stap mekem namba blong fis olsem malet i stap godaan plante.



## HUK MO LAEN WETEM BET

Huk mo laen oli yusum long ol defren kaen fasin. Wan we yu holem long han nomo i wan isi tul blong mekem from i gat wan o plante huk we oli fasem i go long wan laen mo wan wet i stap long en blong laen ia taem oli yusum blong kasem fis we i stap daon long botom blong solwota. Ol huk blong tedei we i raon oli sem mak nomo long kaen huk we oli mekem aot long bun o sel we oli stap yusum long long taem bifo long ol aelan blong Pasifik.



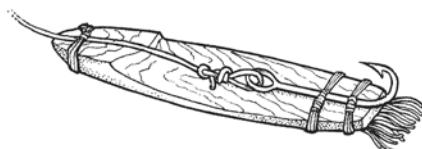


## TOLAEN MO LUA

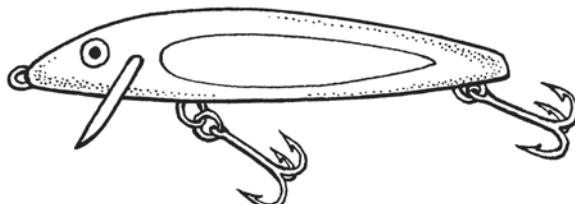
Wan lua hemi wan samting we man i faenem o mekem blong atraktem ol fis blong kam long hem. Yu save luk sam eksampol daon. Lua we i stap long en blong fising laen wan bot i save toem o pulum long tolaen ia (trolling) insaed long ol eria klosap long so blong kasem ol karong mo snapa. Evri lua oli mekem blong atraktem fis from oli gat sam long ol fasin ia olsem: taem we lura i to long wota, lua i stap muvmuv (olsem wan fis we i gat kill), lua i stap saen o aotsaed blong hem i mekem sado, mo long en blong wan lura i gat feta, plastik, raba o kaliko we stap muvmuv.

Long tekem ples blong yusum ol lua we oli stap mekem long faktiri, yu save yusum wan smol fis we i stap saen, olsem long maot fis mo flaeing fis, o wan pis blong wan bigfala fis we i save stap long wan o plante huk olsem wan najarol bet blong tolaen.

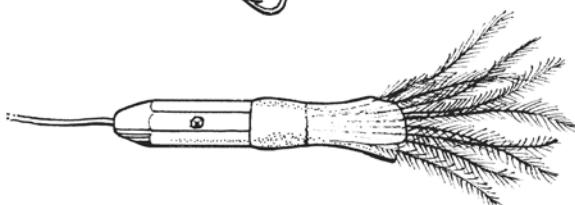
Yu save yusum wan lua taem yu sakem laen. Long fasin ia, yu fasem lura i go long laen we istap long wan fising rod. Rod ia yu yusum blong sakem laen mo lua igo long solwota mo yu tanem smol wil long rod blong pulum lua i kambak.



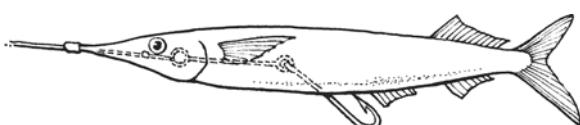
wan tradisionel lua we oli  
mekem long sel wetem wan  
aean huk



wan strong lua we oli  
mekem long faktiri  
blong daeva wetem



wan fising lua we i sofsof  
we oli mekem long faktiri

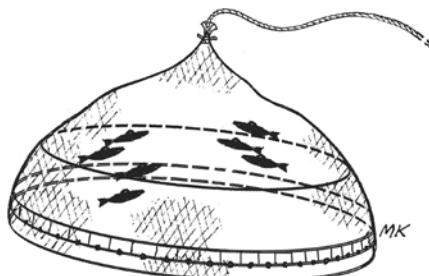


wan longmaot we yu save  
yusum olsem natorial bet



## CAST NET

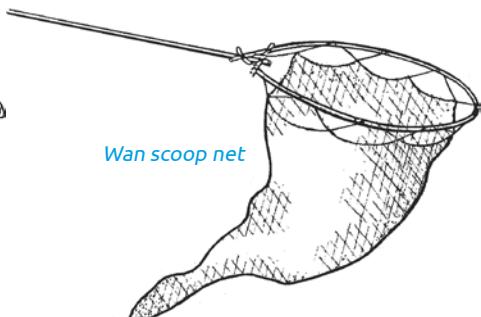
Cast net hemi wan raon net we yu stap sakem taem yu stap long so o aot long wan smol bot o kanu long ol ples we wota i no dip. Taem yu sakem net ia, hemi open olsem wan parasut. Olgeta wet long saed blong hem i stap pulum net i go daon ova long ol fis we i stap wan ples mo net i klos taem yu pulum nara en blong hem. Ol fis we net ia i save kasem hemi ol sadin, malet, piko mo mangru.



Wan cast net afta  
we yu sakem

## SCOOP NET

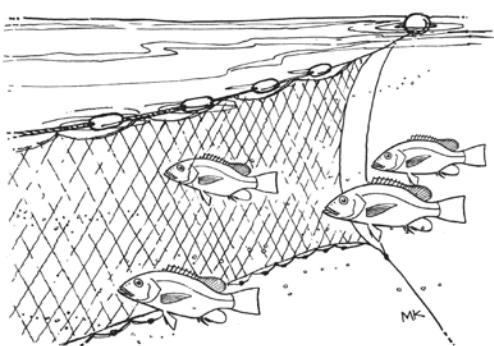
Scoop net, sep blong hem i olsem wan kon we i hang daon aot long wan sapot we i gat handel blong hem. Scoop net yu save yusum long naet taem yu yusum wan laet blong kasem ol smol fis mo naora.



Wan scoop net

## GILL NETS

Gill net i wan kaen net we i gat flota raon long top blong hem mo ol wet long botom blong hem, minim se i save hang daon stret insaed long wota. Net ia yu save fasem hem blong hang long wota we i no dip blong kasem some kaen fis olsem malet o mangru. Net ia oli stap mekem long ol naelon tred we klosap yu no save luksave, mo i save fas bihaen long sora (gill) blong fis. Saes blong hol blong ol net ia oli wokem blong kasem stret saes blong wan kaen fis; wan gill net we oli prepea gudwan wetem stret saes blong ol hol blong net i save letem ol smol smol fis mo fis we i big wan tumas i save ronwe.

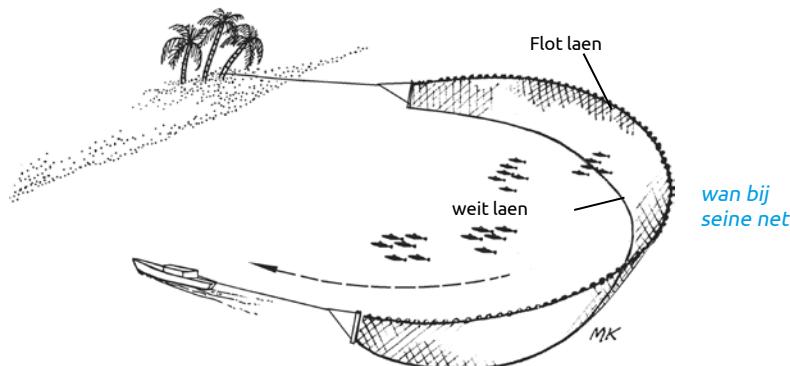




## SEINE NETS

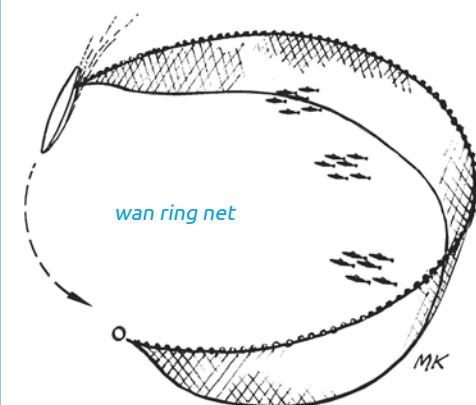
Wan seine net (samtaem oli kolem beach seine sipos oli setemap long so) i gat longfala panel blong ol net we i raonem fis, stat long wan en blong so go kasem nara en blong so mo net ia i pulum ol fis i kam long so. Net ia hemi gat ol wet blong kipim botom blong net i stap strong wetem sandbis mo flota we i mekem net i flot i stap antap. Sam blong ol bij seine oli gat wan net

bakegen long medel blong olgeta we i slak mo i olsem wan bag blong holem taet fis. Ol fasin blong sakem seine net i difren oltaem be plante taem en blong net ia i mas gat wan angka we i stap long so mo wan bot we oli yusum blong putum net ia long wan haf sekel wetem en blong hem long so bifo oli pulum i kam (luk long pikja).



## RING NETS

Ring net hemi wan bigfala net we oli yusum blong raonem fis. Plante taem, wan en blong net oli taetem i go long wan flota mo wan bot i pulum net i go raon long grup blong fis. Taem we net i raonem fis olsem wan sekel, nara en blong net i taet istap long fored blong bot. Yu pulum net ia slo slo bihaen long bot blong mekem sekel blong net i kam mo smol mo blong pulum ol fis i stap tugeta long smol en blong net. Yu save kilim wota blong mekem fis oli fraet mo go insaed long net. Yu gohed blong pulum net nomo mo karemaot ol fis we i stap long net taem we net i stap kam insaed long bot. Samtaem oli yusum ol ring net long naet wetem wan laet we i stap long bot blong atraktem fis.





## 4 Hao ol komiuniti i manejem fiseris

Bigfala pepos blong manejmen blong fiseris, sapos hemi stap long han blong komiuniti o sapos i stap long han blong otoriti blong fiseris, hemi blong mekem sua se fising hemi sastenebol. Sapos manejmen hemi wan skses, ol kakae blong solwota bae i stap oltaem blong yumi tedei mo blong olgeta we i kam afta.

Blong fising i stap sastenebol, i minim se yumi mas stap alaoem ol bigfala fis blong laef longtaem inaf blong save mekem ol smol pikinini fis, we plante bae oli gru bigwan mo oli save stap oltaem blong yumi save kasem olgeta long fiuja, mo blong protektem ol envaeromen we ol fis mo ol nara animol blong solwota i stap laef long hem. Ol impoten envaeromen ia hemi olgeta natongtong, ol si gras mo ol korel.

Kaen fasin ia blong lukaotem fis be semtaem blong lukaotem eria we olgeta i stap long hem oli kolem ecosystem approach long manejmen blong fisers. Taem ol komiuniti blong yumi oli yusum fasin ia, naoia oli kolem hem community-based ecosystem approach to fisheries management (CEAFM). Hemia i wei we oli manejem fiseris, be sem taem oli stap lukaotem ol samting we i stap laef tugeta wetem ol nara samting long ples blong olgeta, long wan wei we olgeta lokol komiuniti oli wok wanples wetem nasonal gavman o ol nara patna.

**Yumi no mas foget se stampa ting-ting blong manejem ol fiseris i blong manejem yumi ol pipol. Plante taem hemi minim se yumi mas blokem ol pipol blong no tekem tumas fis, mo no yusum ol fasin blong fising we i stap spolem envaeromen blong solwota.**

Ol komiuniti oli sud yusum ol infomesen we i stap blong manejem ol risos blong solwota. Ol infomesen long saed blong saens i stap wetem ol advaesla blong komiuniti, olsem ol totel monita, wetem nasonal fiseris dipatmen mo wetem ol non-gavman oganaesesen we i stap olsem Wan Smol Bag, mo ol oganaesesen olsem SPC. Be antap long evri samting ia, ol komiuniti i sud yusum ol save blong ol fisa blong ples blong olgeta. Ol pipol we oli stap fising long ples ia plante taem oli save long wea ples mo long wanem taem ol fis i stap mekem pikinini. Maet tu oli save wiswan fasin blong fising i spolem fiseris wetem envaeromen blong solwota.

Plante fasin o tul oli stap rere blong yusum blong manejem fiseris mo sam oli stap long list long sekzen 5. Plante long ol fasin ia oli bin stap mekem long ol fising komiuniti blong ol aelan long Pasifik ova long plante handred yia finis.

No mata wanem kaen tul blong manejmen yumi yusum, i impoten blong luksave sapos tul ia i ajivim wan skses. Insaed long wan komiuniti, i stret blong luk sapos fasin blong manejem fiseris i impruvum o i kipim long sem mak namba blong ol fis we oli kasem.

**From rison ia, i mas gat ol ansa long sam kwestin, olsem olgeta ia:**

- Risev blong fis (tabu eria) i wok gudwan? Namba blong fis i stap go antap?
- Ban (o tabu) long saed blong fising wetem net hemi mekem namba blong ol fis i go antap?
- Tabu long saed blong no kasem sam kaen fis hemi minim se namba blong fis i go antap?



Sapos fasin blong manejem fiseris we komiuniti i yusum fastaem i no wok gudwan tumas, olgeta i sud traem sam nara wei. Hemia i wan fasin blong wok we ol man blong saens long fiseris oli givim nem blong hem adaptive management – hemia i blong gohed blong traem wan stret fasin blong manejem mo afta blong luk sapos hemi wok gudwan; sapos i no gat ol gud risal, oli jenism fasin ia smolsmol o oli traem wan difren fasin.



Ol fisa long wan komiuniti i intres plante sapos fasin blong manejem fiseris hemi minim se, naoia o long fiuja, namba blong fis i go antap long eria blong olgeta. Ol stampa fasin we yumi save luksave se fasin i wok gudwan i hamas fis oli save kasem (catch rate) mo saes blong olgeta fis ia (luk long 7e mo 7f long seksen 7)

Catch rate hemi minim hamas fis oli save kasem long wan taem o, blong luk long hem long wan nara wei, hamas taem i tekem blong kasem hamas fis, olsem i tekem hamas taem blong tekem wan rop blong fis, wan basket blong klam, or wan namba blong naora.

**Sapos taem blong fising i go antap, i minim se namba blong fis maet hemi stap godaon mo fasin blong manejem i no stret. Long eksampol ia, oli mas yusum wan difren kaen fasin blong manejem, sapos no ademap sam mo fasin blong manejem long fasin we oli yusum fastaem.**

**Sapos taem blong fising i stap semak, i minim se maet namba blong fis i stap sem mak. Long eksampol ia, maet oli save tingbaot hao blong ademap sam mo fasin blong manejem o hao blong jenism olgeta smol.**

**Sapos taem blong fising i go daon, maet i minim se namba blong fis o ol nara animol blong solwota i go antap. Long eksampol ia, maet ol fasin blong manejem i stret.**

Fasin blong luk long sakses blong fasin blong manejem we i dipen long infomesen we i kam long ol lokol fisa samtaem oli singaotem hem data-less management, from hemi no dipen long ol sevei we ol man blong saens blong fiseris i wokem, we samtaem hemi yusum plante taem mo vatu.



# 5 Ol fasin blong manejem ol fiseris

Ol fasin blong manejem ol fiseris i inkludim ol rul we nasonal dipatmen blong fiseris i mekem, mo ol rul we wan komiuniti i putum, blong traem mekem sua se fising hemi sastenebol mo ol namba (stock) blong fis bae i gohed blong provaedem kakae long fiuja. Maet oli save yusum plante difren kaen fasin blong protektem ol difren spisis mo sam long olgeta i stap long list daon.

I no evri wan long ol fasin ia we i stret blong yusum wetem evri kaen spisis. I gud blong luk long wanwan pepa blong toksave blong faenemaot wiswan fasin i stret long wiswan spisis.

- **Blong limitim amaon blong fising:** wan rul we i limitim hamas pipol i save stap fising o hamas taem oli save spendem blong fising: wan eksapol, oli save alaoem ol pipol blong wan komiuniti nomo blong fising.
- **Blong limitim kaen tul blong fising o sakese blong wan kaen tul:** wan rul we hemi mekem i tabu o we hemi kontrolem yus blong tul we i save damejem ol stok blong fis o we i save wok gudwan tumas; olsem, no letem ol fisa i yusum ol gill net we oli longfala tumas o we hol blong olgeta i smol tumas, o blong mekem i tabu blong yusum ol tul olsem SCUBA we i alaoem daeva blong pulum win taem hemi stap anda long solwota, long ol fiseris we oli daeva from fis.
- **Blong limitim hamas fis oli save kasem:** wan rul we hemi limitim namba o wet blong fis we oli save kasem; olsem limit we i stap long hamas troka yu save kasem long sam kaontri.
- **Blong limitim saes blong fis we yu save kasem blong i no smolwan tumas:** wan rul we i talemaot saes blong wan fis we i no save go anda long hem; rison blong rul ia plante taem hemi blong alaoem wan fis blong mekem pikinini wan taem o mo bifo oli kasem hem.
- **Blong limitim saes blong wan fis we yu save kasem blong i no bigwan tumas:** wan rul we i talemaot saes we wan fis i no save go antap long hem; rison blong rul ia plante taem hemi from ol woman fis we i bigwan mo oli prodiusim mo eg o from ol fis we i mo bigwan valiu blong olgeta i no hae tumas.
- **Blong no kasem ol woman krab mo naora we oli karem eg:** wan rul we i mekem se ol fisa i mas putum igobak long solwota eni woman krab o naora we i gat eg blong givim taem long olgeta blong prodiusim pikinini blong olgeta.
- **Taem we ol eria blong fising o ol taem blong fising i klos:** wan rul we i talem se i no save gat fising, maet long wan taem o sison o maet long wan ples, o tufula tugeta; olsem eksapol, maet wan ples we fis i stap mekem eg i save klos long sison blong hem evri yia.
- **Ol resev blong fis (ol eria we oli no save tekemaot fis long eni taem):** wan eria we ol man i no save go fising insaed long hem; maet hemi blong alaoem namba blong fis i go antap mo blong ol fis i save gru mo mekem pikinini; tingting blong wan komiuniti i se blong blokem ol pipol blong no tekem fis insaed long wan pat blong tradisinel eria blong fis blong olgeta i save mekem ol namba blong fis long ol ples klosap i go antap long fiuja. Oli tokbaot ol fis resev olsem wan spesol eksapol long Seksen 6.

Hemi impoten blong luksave se i no save gat wan long ol fasin blong manejem wan fiseris we i save wok sapos ol pipol i no agri blong respektem eni rul we i stap mo sapos ol lida blong komiuniti i no mekem se oli folem.

Long klosap evri fiseris maet i gat nid blong yusum wan o antap long wan fasin blong manejem o rul blong mekem se stok blong fis hemi sastenebol.



## 6 Ol fis risev we komiuniti i stap manejem o ol eria we ol man i no save tekem fis aot long hem

From fis resev, solwota resev o tabu eria hemi wan long olgeta tul we plante komiuniti oli setemap finis o oli stap tingbaot yet long plante long ol aelan blong Pasifik, oli tokbaot olgeta long ples ia olsem wan spesol eksampol. Be blong setemap wan tabu eria hemi wan nomo long ol fasin we ol komiuniti i save tekem blong protektem olgeta fis; oli no wok sem mak wetem evri nara kaen animol blong solwota.

No mata long hemia, ol tabu eria oli save help bigwan blong protektem plante long ol plant mo animol (biodiversity) blong wan eria inkludim ol ples we fis i stap laef long hem, ol ecosystem mo ol spisis we i dipen long hem. Be ol man ples we oli nidim blong tekem ol kakae blong solwota long evri dei oli intres mo, sapos resev hemi save mekem namba blong fis i go antap long ol eria blong fising we i stap klosap.

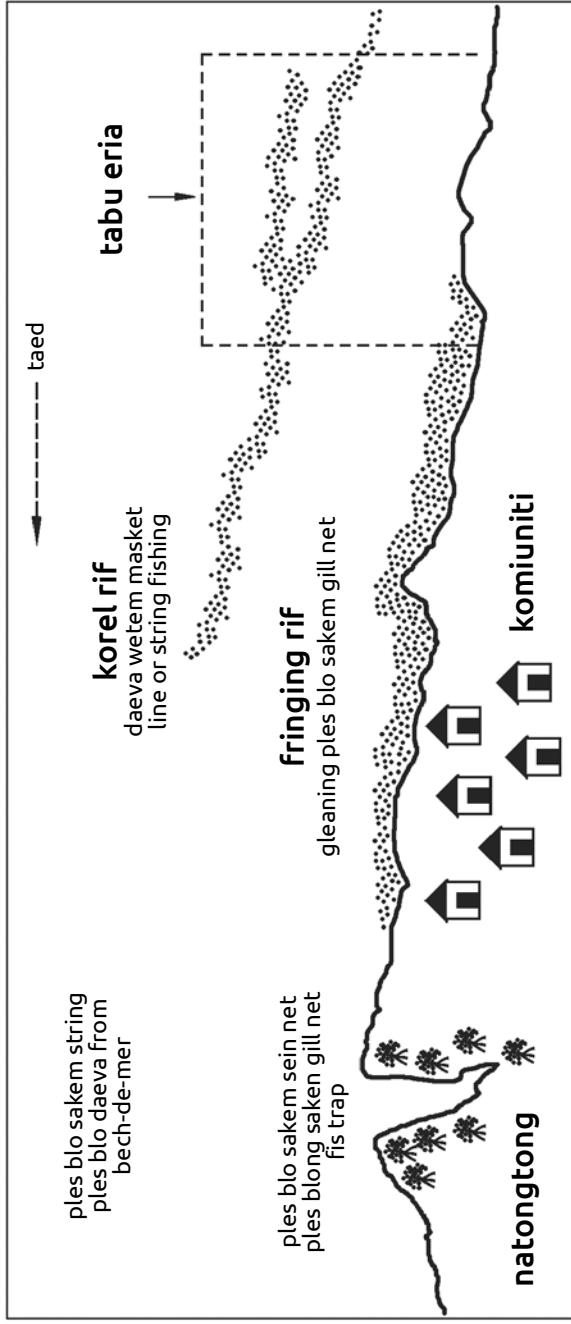
Sakses blong wan resev blong solwota, wan tabu eria, hemi dipen long sam samting, olsem saes blong resev mo ples we hemi stap long hem mo ol spisis we oli manejem insaed long hem. Ol men samting blong tingbaot i olsem:

- Blong ol spisis we oli stap muv olbaot plante olsem malet yu no save yusum wan resev we i smol tumas;
- blong ol spisis we i muv igo long ol eria blong prodiusim eg blong olgeta we i stap long wei aot long resev, wan smol lokol resev i no save protektem olgeta blong oli no kasem olgeta taem oli muv igo tugeta blong putum eg blong olgeta;
- blong ol spisis we oli gat wan sot taem we ol pikinini blong olgeta i stap flot (olsem troka), taem oli mekem pikinini oli prodiusim ol yangfala we maet oli go olbaot insaed long resev mo long ol eria blong fising we i stap **klosap**. Hemia i minim se ol smol resev nomo oli save gat sakses blong bildimap ol populesen **klosap**, eespeseli sapos resev hemi stap long wan ples we taed i save karem olgeta aot long resev i go long eria blong fising;
- blong sam spisis we i gat wan long taem we olgeta pikinini i stap gru (olsem naora), taem oli mekem pikinini maet olgeta yangfala oli go long wei aot long resev mo ol lokol eria blong fising. Hemia i soem se ol lokol resev blong fis maet oli no wok gudwan blong bildimap wan *lokol* populesen blong spisis ia long ples ia nomo. Kaen resev olsem maet oli gud long wan eria we i mo big **olsem long wan rijken o long ful kaontri**, eespeseli sapos i gat wan bigfala namba blong ol smol resev olsem we i seraot long laen blong kos.



## Oli eria we oli manejem

Wan eria we oli manejem hemi wan we i gat ol risos we oli mas manejem. Hemia i inkludim wan tradisinel graon blong fising we komiuniti blong ples ia mo maet sam mo komiuniti oli gat sam kontrol ova long hem.



Map ia antap i soem wan eria blong meneimen wetem ol limpoten samting long hem, olsem fores blong natongtong, rif we i stap klosap long so, korel rif mo sam eria blong fising. Maet wan eria blong manejem hemi inkludim wan tabu eria, be i no oaltaem. Smol not: oli putum tabu eria i stap long wan ples we taed i save karem ol smol pilkinini blong risos we oli stap flat aot long reserv i go long ol eria blong fishing.



# 7 Ol toktok we i save gohed insaed long ol komiuniti blong fising

Seksen ia hemi givim wan gaed blong ol samting we ol komiuniti blong fisa oli sud tokbaot. Ol toktok ia i mas tekem ples long saed blong ol fasin blong risos manejmen blong wan komiuniti blong mekem sua se komiuniti i yusum gudwan ol lokol mo tradisinel save we i stap. Fasin ia tu i mekem sua se manejmen blong fiseris hemi stap stret long han blong fiseris komiuniti.

## a) Wanem i stret nem long lanwis blong komiuniti blong spisis ia?

Ol komon nem insaed long wan kaontri maet oli difren long wanwan ples, olsem wetem yumi long Vanuatu evri lanwis i gat stret nem blong hem blong wanwan spisis. Hemi impoten tumas blong mekem sua se evriwan i stap tokbaot sem spisis o grup blong spisis. Maet i gud blong gat ol pikja o ol foto blong olgeta spisis long taem blong ol miting.

## b) I gat eni rul long saed blong nasonal fise- ris we i aplae long kaen spisis ia?

Ol nasonal rul oli kam fastaem ova long ol rul blong komiuniti. I impoten tumas blong save sapos i gat eni rul we i aplae long komiuniti mo tu se ol fisa blong komiuniti oli save long olgeta. Ol rul blong komiuniti i no mas go agenstem o brekem ol nasonal loa mo rul.

## c) Wanem i eria blong komiuniti blong fising long hem blong kasem spisis ia (o grup blong spisis)?

Yu mas rikodem eria blong fising long wan map blong eria we yu stap manejem (o long eria we yufala i manejem long fiuja) mo inkludim ol eria blong intres, olsem ol rif mo ol mak blong laen blong so. Mekem not blong eria we oli damej tru long aksen blong ol pipol, inkludim olgeta aotsaed long komiuniti (olsem ples we sanbis i blokem wota, ples we ol pipol i sakem rabis, mo ol nara kaen polusen).

## d) Komiuniti i gat sam control ova long fising eria blong hem?

Sam komiuniti i gat tradisinel kontrol ova ol eria blong fising we i stap klosap. Sapos ol komiuniti i no gat kontrol, sam kaontri, olsem Tonga, oli bin setemap Special Management Areas (SMAs) we i alaoem ol komiuniti blong manejem fiseris blong olgeta.

## e) Long wiswei ol catch ret (hamas fis oli kasem long wan dei, o wan fising trip) oli jenis ova long 10 yia we i pas?

I impoten tumas blong gat sam tingting long eni jenis long hamas fis komiuniti i kasem, hamas taem hemi tekem blong kasem wan basket o rop blong fis 10 yia i pas finis mo 5 yia i pas finis; hao nao yu save komperem namba blong fis we oli kasem bifo wetem nao ia? Olsem wan rul we i jenerol tumas, sapos i tekem ol pipol tu taem tedei blong kasem sem namba blong fis komperem wetem taem bifo, maet i minim se stok blong fis oli klosap flatem. Sapos i tekem ol pipol bitim long tu taem blong kasem sem namba blong fis we oli kasem bifo, maet i minim se stok blong fis oli flatem olgeta.

## f) Hao nao longfala blong fis oli jenisim ova long 10 yia we i pas?

Taem yu fis, plante taem yu tekemaot ol fis we i mo big aot long populesen blong fis. Sapos nomol saes blong wan kaen spisis we yu kasem i godaon, maet i minim se yu stap fisim kaen ia tumas. I gat nid blong putum sam fasin blong manejmen blong protektem spisis ia.



- g) Olgeta fisa long komiuniti oli yusum wanem kaen fasin blong fising?**  
Komiuniti maet hemi yusum sam kaen fasin blong fis we i defren long olgeta we i stap long ol pepa blong toksave. Sam long ol fasin ia yu ting se oli damejempopulezen blong spisis o envaeromen blong solwota?
- h) Spisis ia hemi gat wan stret sisen blong putum eg o wan stret ples we oli wokem?**  
Maet sam memba blong komiuniti oli save gat wan ansa long kwestin ia. Infomesen ia komiuniti i save yusum blong manejem fiseris blong olgeta, maet oli katem daon o blokem olgeta blong no fising long sam taem blong yia o long sam ples.
- i) Yu save mekem wanem blong mekem namba blong spisis ia we oli kasem i kam mo sastenebol?**  
Maet ol memba blong komiuniti i save givin tingting blong olgeta long hao blong tekem sam praktikol fasin blong manejmen. Ol tingting ia oli save tokbaot wetem ol fasin blong jusum we i stap long wanwan long ol pepa blong toksave.
- j) Komiuniti blong fising oli gat stampa tingting mo abiliti blong tekem ol disisen blong manejmen long intres blong sastenem ol namba blong fis we oli kasem mo blong lukaotem gudwan ol fiuja jeneresen?**  
Trifala samting we wan manejmen blong fiseris blong wan komiuniti i nidim i luksave, wari mo aksen. Wan komiuniti i mas luksave ol problem blong fiseris blong olgeta mo oli mas stap wari long olgeta inaf blong mekem oli tekem ol strong mo independen aksen.
- k) Komiuniti blong fisa hemi glad blong mekem sua se komiuniti i folem ol rul we oli mekem?**  
Sakses blong fiseris manejmen blong wan komiuniti i dipen bigwan long ol memba blong komiuniti blong respektem ol rul blong manejmen we oli mekem. Wanem maet komiuniti o ol lida blong hem i save mekem long olgeta we oli no folem ol rul ia we komiuniti i bin mekem?





# 8 Ol toktok we yumi stap yusum long fiseris wanem nao oli minim

No mata we olgeta we oli raelem ol pepa blong toksave oli no yusum tumas ol teknikol wod, maet yu save faenem ol mining blong wod (daon) we i save helpem yu.

**Adult:** wan taem long laef blong wan spisis we hemi gruap finis.

**Ciguatera:** (sik blong fis) hemi kamaot taem yu kakae wan fis we hemi gat posen insaed long bodi blong hem from hemi stap kakae ol nara smol fis we i stap kakae ol smolsmol plant (phytoplankton) we oli stap long ol korel rif. I gat sam pikja long en blong seksen ia we oli yusum blong mekem ol komiuniti i luksave ciguatera long ol aelan blong Pasifik.

**Community rule:** wan rul (we i klosap olsem wan rul we gavman i putum) we komiuniti i disa long hem, mo oli agri long hem mo fising komiuniti i mekem sua se olgeta i folem.

**Community-based ecosystem approach to fisheries management (CEAFM):** manejmen blong fiseris insaed long wan ecosistem (we i inkludim ol fisa, ol fis mo ol ples we oli stap long hem) we wan lokol komiuniti i wokem wetem gavman mo eni nara oganaesen. Hemi inkludim manejmen blong ol aktiviti long so (olsem agrikalja mo fam) we i afektem envaeromen blong solwota.

**Community-based fisheries management (CBFM):** long wei we wan komiuniti i tekem responsibiliti, plante taem wetem help blong gavman o wan NGO, blong manejem envaeromen blong kos wetem fiseris blong hem.

**Customary marine tenure (CMT):** wei we ol stret man ples oli kontrolem graon, solwota mo ol risos we hemi stap long saed blong loa o kastom mo tru long praktis.

**Destructive fishing:** Ol fasin blong fising we i spolem ol populesen blong fis (olsem, taem we fis i kam wamples o oli kam tugeta blong putum eg) o i spolem envaeromen (olsem, oli brekem korel blong kasem ol smol fis mo blong yusum ol posen o danamaet blong kasem fis).

**Ecosystem:** wan sistem we i gat ol plant mo ol animal (inkludim ol man) insaed long hem we oli wok tugeta mo wetem ol samting long envaeromen we i no laef.

**Eggs:** ol smolsmol samting we wan woman animal i prodiusim, we i save develop ikam ol niu animal taem wan man animal i putum melek blong hem (sperm) long olgeta. Fish reserve (no-take area): wan eria we ol pipol i no save tekem fis aot long hem (wan tabu eria)

**Food web:** ol relesensip long saed blong kakae we i konektem ol plant mo animal

**Habitat:** stret hom blong wan animal olsem fis o natalae.

**Hookah:** wan tul we i pusum ea i go long ol pipol we oli daeva anda long wota be oli no yusum SCUBA.

**Juvenile:** yangfala blong wan spisis we hemi no save mekem pikinini yet.

**Key habitats (or critical habitats):** ol ples we wan spisis i laef long hem we i impoten tumas long saekol blong laef blong hem, long saed blong ol fiseris maet i inkludim ol eria we ol smol animal i stap gru long hem mo ol eria blong putum eg, olsem ol maot blong riva, ol natong-tong, ol eria blong si gras mo ol rif.

**Larva (plural larvae; pronounced lar-vee):** Long ol spisis blong solwota, plante taem hemi ol smolsmol animal we i stap flot bitwin long taem we hemi eg mo taem we hemi kam yangfala o pikinini.

**Managed area:** eria we i gat insaed long hem ol risos we oli manejem, plante taem wan kastom eria we lokol komiuniti o maet ikat bitim wan komiuniti i kontrolem long wan smol fasin.

**Marine Protected Area (MPA):** wan eria blong solwota we oli protektem hem, we wan loa o wan nara strong toktok i blokem hem olsem wan fasin blong help blong presevem mo protektem impoten daevesiti, risos mo ples we ol animal i laef long hem long solwota; hamas blong help ia i stap i dipen long hamas ol pipol i save



yusum eria ia. Long fasin ia maet ol otoriti i save kontrolem o maet oli save blokem blong ol man i no fis long sam pat o long ful eria blong MPA ia. Long sam kaontri blong Pasifik oli yusum toktok ia long wan wei we i no stret gudwan blong tokbaot wan eria we i tabu blong fis long hem.

**No-take area (o fish reserve):** wan eria we ol pipol i no save fis insaed long hem, wan tabu eria.

**Overexploitation o overfishing:** blong kasem wan hae namba blong ol animal blong solwota (we i inkludim fis, natalae, krab mo nara animal) we i no sastenebol, minim se, sapos oli gohed blong fis, ol namba we oli kasem bae i go daon sloslo.

**Pollution:** fasin we ol man oli putum i go insaed long solwota eni kaen samting we hem i save spolem envaeromen blong solwota. Maet olgeta i save se oli mekem olsem, maet oli no save.

**Scientific name:** nem blong wan spisis we i sem mak long ol kaontri mo long ol lanwis we ol man blong saens i yusum. Nem ia i gat tu pat. Fas pat hemi nem blong genus (wan grup blong wanwan kaen plant o animal we i gat sam samting i sem mak long olgeta). Namba tu nem hemi nem blong spisis (wanwan plant o animal insaed long genus we oli gat plante samting we i sem mak). Blong givim wan eksapol, white teatfish, Holothuria fuscogilva, mo black teatfish, Holothuria whitmaei, oli klosap sem mak minim se tufala i save stap long sem genus, be i gat inaf samting we i difren blong luk long olgeta olsem tu difren spisis.

**SCUBA:** wan kaen tul blong daeva andanit long solwota we ol pat blong hem i stap wanples. I gat wan botel o tang blong ea, wan samting blong kontrolem hem mo wan pat we i go insaed long maot olsem wan aqualung.

**Spawning aggregation:** wan grup blong wan sem kaen fis o animal, we plante blong olgeta oli kam wan ples, we i no sem mak long evri taem, blong street pepos blong mekem pikinini. Plante long ol aggregation oli stap long sem ples mo long sem taem long evri yia. Namba wan eksapol hemi sam kaen los mo snapa fis. Be plante kaen poketnaef fis, blufis mo napoleon olgeta tu oli go tugeta long taem blong mekem pikinini.

**Spawning site:** Ples we wan spisis i go tugeta long wan spawning aggregation.

**Spawning:** fasin blong kapsaetem eg blong wan woman fis mo melek blong wan man fis.

**Species:** wan grup blong ol samting we i laef. Olgeta i stap sem mak long plante wei mo oli save mekem pikinini tugeta.

**Sperm:** wan kaen samting olsem melek we ol man animal i save kapsaetem we i save mekem ol eg blong ol woman animal i stap gru.

**Subsistence fishery:** wan fiseris we olgeta famli blong ol fis mo ol memba blong komiuniti oli seremaot mo kakae ol fis be oli no salem olgeta.

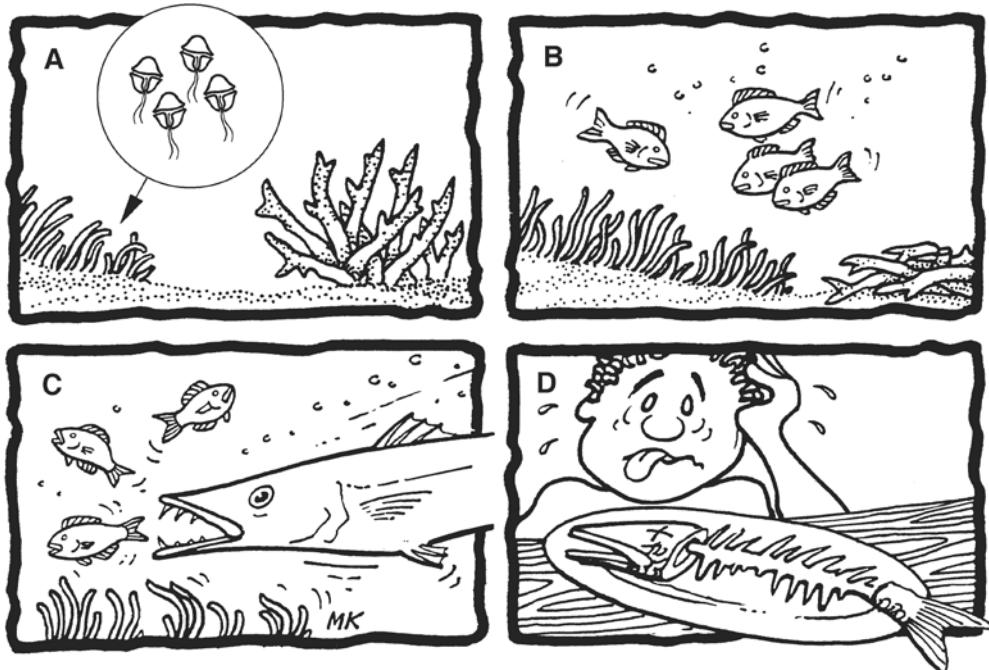
**Sustainable:** samting (long ples ia fising) we i save gohed mo i no save finis.

**Underwater breathing apparatus:** wan tul, olsem SCUBA o Hookah, we i letem wan man i pulum win o gas taem hemi stap andanit long wota.

**Wetlands:** ol eria we i stap daon, long graon we taed i save kavremap olgeta mo maet oli gat wota we i stap antap long olgeta o maet wota i go tru long olgeta. Ol eksapol i inkludim ol wet graon we i gat sol long hem, ol swim we i stap long kos mo ol fores blong natongtong.



## Hao ol iven i go taem wan man i gat posen blong ciguatera:



- A. **Wan smolsmol plant** (nem blong hem dinoflaggelate) i gru olsem wan nalulum long korel o si gras. Long evri taem i no gat plante tumas blong plant ia, be ol namba blong hem i save go antap bigwan taem i gat ol gudfala nutrien we i save yusum. Ol nutrien oli go antap long ol taem we i gat plante ren i foldaon mo i ran from graon i go long solwota mo long taem blong saeklon taem ol nutrien i kamoat long ol laen blong so mo ol rif taem saeklon i damejem olgeta. Nutrien i save go antap tu taem sitsit blong man o feta-laesa blong agrikalja i go insaed long ol wota blong kos.
- B. **Ol smol fis i kakae** ol smolsmol plant we oli gat posen long olgeta.
- C. **Ol fis we i mo bigwan oli kakae** ol smolsmol fis minim se posen i kam bigwan long sam long ol bigfala fis.
- D. **Olgeta pipol we oli kakae fis** ia oli gat ol problem olsem oli harem se skin i muvmuv smol, bodi i haf ded, mit i stap soa, mo i gat wan difren kaen fasin we oli harem se wan kol samting i hot taem hemi tajem, mo wan hot samting i kolkol. Sapos posen ia i strong tumas, man i save ded from, from hemi no save gohed blong pulum win.



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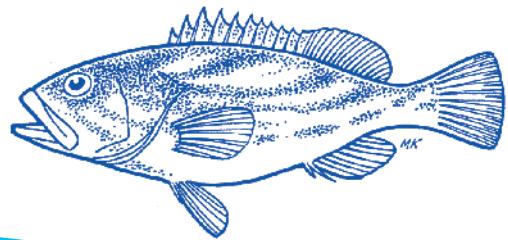
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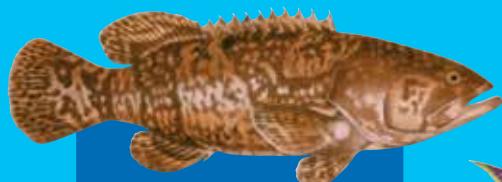
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# Los

## Groupers (Epinephelidae)



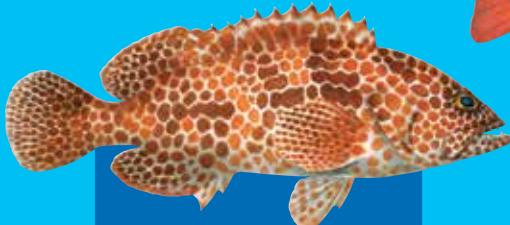
**Blu spot los**  
Peacock hind  
(*Cephalopholis argus*)



**Bigfala los**  
Giant grouper  
(*Epinephelus lanceolatus*)



**Flawa los**  
Yellow-edged lyretail  
(*Variola louti*)



**Hanikom los**  
Honeycomb grouper  
(*Epinephelus merra*)



**Tonu los**  
Leopard coralgrouper  
(*Plectropomus leopardus*)



**Braon mabol los**  
Brown-marbled grouper  
(*Epinephelus fuscoguttatus*)



### Spisis mo distribiusen

I gat klosap 160 spisis blong los. Fis ia i gat ol defren spisis be plante long olgeta oli gat waed bodi wetem bigfala hed mo maot. Plante spisis oli gat ol spot we i gat ol defren kala olsem yelo, grin mo braon, minim se oli save haed gud long ol samting blong solwota.

Ol defren spisis oli stap long ol tropikol wota mo long ol wota we i no hot tumas raon long wol. Long Pasifik namba blong ol spisis i go daon stat long is igo long wes be ol impoten spisis blong kakae yu save faenem long ol tropikol aelan.

Bigfala los, we nem blong saens blong hem hemi *Epinephelus lanceolatus*, hemi wan long ol bigfala fis long wol mo i save gru kasem 3 mita mo wet blong hem i save kasem 600 kg. Be plante long ol smol los (40 cm go kasem 50 cm) oli impoten tumas long ol lokol komiuniti blong yumi.



### Ples we fis i stap long hem mo kakae blong hem

Impoten ples we los i stap long hem mo gru long hem hemi ol salo eria long solwota we i gat ol smol smol pis korel long hem (ples we ol smol fis i stap long hem), long korel rif (ples we ol bigfala fis i stap long hem) mo ples we oli stap go long hem blong grup tugeta mo mekem pikinini. Plante long ol bigfala animol oli gat smol eria nomo (eria we oli stap laef mo kakae long hem) mo wan man fis i save gat wan grup blong samfala woman fis long wan eria blong rif.

Ol los oli no save swim hariap ova long wan long distens mo plante taem oli ledaon kwaet mo yusum maot mo sora (gill) blong olgeta blong pulum kakae blong olgeta aot long hol blong rif. Olgeta oli kakae fis, smol sak, yangfala totel, nawita mo naora.





#01

# Los Groupers (Epinephelidae)



## Riprodaksen mo saekol blong laef

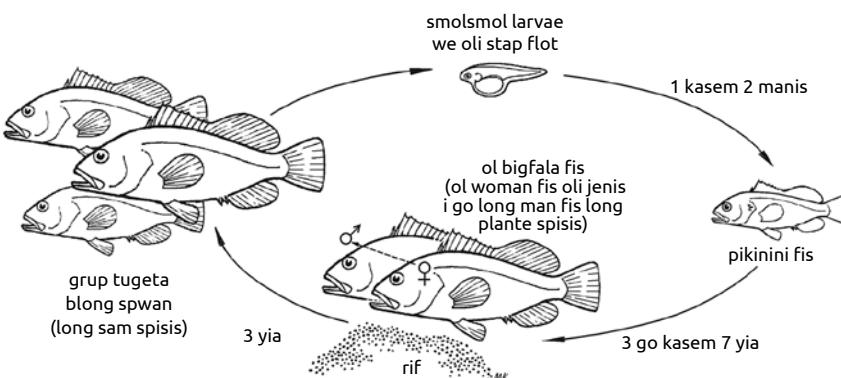
**Ol los oli gru sloslo mo sam spisis oli save laef blong 5 go kasem 15 yia.**

Sam long ol komon spisis oli save kasem 30 go kasem 50 pesen blong laef blong olgeta blong save mekem pikinini. Plante long ol spisis oli statem laef blong olgeta osem woman (♀) mo jenis i go lo man (♂) taem oli kasem haf blong laef blong olgeta (olsem taem we oli kasem 3 go kasem 7 yia we hemi dipen long wiswan spisis).

Plante spisis blong los oli muv i go long wan spesol eria long sem taem long evri yia blong grup tugeta blong mekem pikinini (spawn). Insaed long bigfala grup blong fis ia, ol woman fis oli givim aot eg (sam blong ol bigfala fis i save prodiusim ova long 1 milian eg) mo oli stap fetalaes wetem sperm we man fis i kapsaetem.

Ol eg we oli fetalaes oli brok blong letemaot ol smolsmol larvae we i flot long taed blong solwota blong 1 go kasem 2 manis. Aot long evri taosen blong ol smolsmol larvae we i flot, isave kat les long wan i save laef blong kam wan yangfala los we i save stap long salo wota klosap long ol rif.

Taem oli stap gru oli stap muv i go long korel rif, mo aot long evri handred blong ol yangfala fis, anda long wan i save stap laef blong kam wan bigfala fis.



## Ol kaen fasin blong manejmen we yu save jusum

I gat sam fasin blong manejmen we oli yusum long los insaed long ol fiseriss. Ol fasin ia oli inkludim fasin blong limitim namba blong fisa (tru long fising laesens), limitim amao blong fis we oli save kasem (quotas) mo kontrolem kaen tul blong fis we oli stap yusum.

Ol fasin ia oli yusum plante long ol fiseriss we bisnis blong olgeta i blong salem fis, komperem wetem fiseriss blong ol komiuniti.

Long sam kaontri oli bin putum minimam saes limit (be oli no jekem gudwan se ol fisa i folem). Be taem yu putum wan minimam saes limit long wan spisis we i jenisim seks blong hem aot long woman i go long man fis, mesa ia i no save help. Sapos oli kasem ol bigfala fis nomo anda long rul ia, olgeta fis klosap evriwan bae i man fis, mo klosap evri fis we i stap long populesen i woman fis.

Ol fasin blong manejmen we yumi save yusum long komiuniti i inkludim

- blokem ol fisa blong no yusum ol gill net, eespeli long ol eria we spawning i tekem ples, from fasin ia i bin katemdaon namba blong ol fis we i stap mekem pikinini.
- blokem ol fisa blong no go fising wetem spia long naet, from fasin ia i bin karemaot plante tumas long ol bigfala fis long wan bigfala eria blong rif

Plante long yumi long ol fising komiuniti i gat save long taem mo ples blong spawning aggregation mo ol infomesen ia yumi save yusum olsem:

- blokem ol fisa blong no go fising long ples we i gat spawning aggregation (we ol fis i go tugeta blong mekem pikinini) – minim se komiuniti i save gat sam kontrol ova long spawning eria.
- blokem ol fisa blong no fis long taem we spawning sison i soem plante aktiviti. Maet yu mas blokem long sot taem nomo wan taem long evri manis from sam spisis oli luk se oli kam tugeta blong spawn long wan stret taem long saekol blong mun.



## Fasin blong kasem los

Blong kasem ol los, oli yusum huk mo laen we i gat bet, ol trap we i gat bet, gill net mo spia. Olgeta oli save hariap tumas blong kakae bet long huk mo blong go bak blong haed long ol hol long korel we oli yusum ol strong masel blong gill blong lokemap olgeta insaed. Ol fisa i yusum spia long sapa o long naet taem we ol los oli muv abaot plante. Los we oli kasem long bet trap oli impoten long laef fis tred.

Plante los oli kasem olgeta taem oli stap long grup blong mekem pikinini (grup blong spawn). Kaen fising ia hemi no gud from ol fis ia wok blong olgeta nao hemi blong prodiusim ol smolsmol fis, we plante bae oli gru blong kam bigfala fis blong oli save kasem long fuija.

Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmannetwork.org](http://www.lmannetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker



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The Locally-Managed Marine Area (LMMA) Network



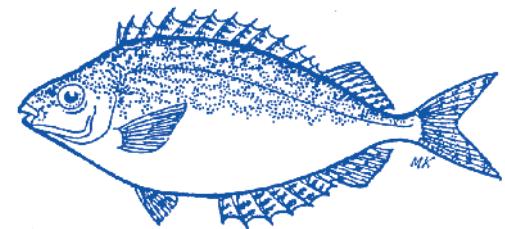
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#02

# Piko

## Rabbitfish (Siganidae)



**Blu piko**  
Streamlined spinefoot  
(*Siganus argenteus*)



**Tofe piko**  
Goldspotted spinefoot  
(*Siganus punctatus*)



**Piser piko**  
Little spinefoot  
(*Siganus spinus*)



**Smos piko**  
Mottled spinefoot  
(*Siganus fuscescens*)



**Weflaen piko**  
Vermiculated spinefoot  
(*Siganus vermiculatus*)



### Spisis mo distribiusen

Famli blong ol piko we nem blong olgeta i Siganidae i gat 28 spisis insaed long wan genus, mo komon nem blong hem i rabbitfish.

Olgeta oli kat smol maot, mo bodi blong plante long ol spisis ia wan paten olesem maze i kavremap olgeta. I gat ol ples we i holem posen we i stap long ol nil blong fin. Posen ia i save givim wan nogud soa. Piko i stap plante ova long Indian Osen wetem Pasifik Osen.



### Ples we fis i stap long hem mo kakae blong hem

Ol bigfala piko oli stap plante long ol maot blong riva, lagun mo salo korel rif long taem blong dei.

Plante spisia blong piko oli stap mekem grup mo oli kakae tugeta ova long bigfala eria blong si gras. Impoten ples blong stap laef long saekol blong laef blong piko hemi ol ples we oli grup tugeta blong mekem pikinini.

Kakae blong piko hemi nalumllum blong solwota mo si gras mo, olesem ol blu fis, oli ting se olgeta i protektem korel from ol plant ia we i save kilim korel taem oli kavremap hem. I luk se olgeta oli stap kakae long ol bed blong si gras oltaem. From plante fis blong rif oli kakae piko, olgeta oli impoten fis long food web blong korel rif.





#02

# Piko Rabbitfish (Siganidae)



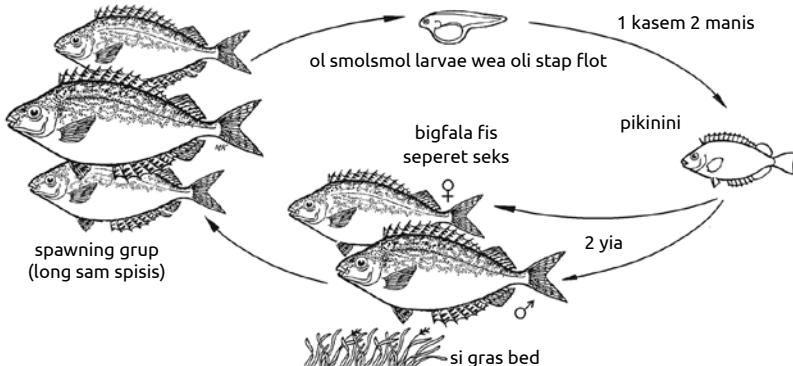
## Riprodaksen mo saekol blong laef

Ol piko oli gat man fis mo woman fis mo oli gru kwiktaem lelebet. Defren spisis maet oli rere blong mekem pikinini taem oli gat 1 o 2 yia (taem longfala blong olgeta i kasem 15 cm.) mo oli save kasem wan longfala blong ova long 40 cm.

Klosap evri spisis i save gat wan longfala sison brid wetem ol smolsmol spawning activiti olsem oli spawn mo stop blong sam dei afta oli spawn bakegen, we i folem saekol blong mun, plante taem long taem blong niumun. Olgeta oli go long ol bigbigfala grup blong mekem pikinini (long spawning aggregation), plante taem long wan ples we oli save go aot long open solwota.

Maet wan woman piko (♀) i save putum haf milian go kasem 2 milian eg, mo olgeta sperm blong ol man piko (♂) i fetalaesem olgeta. Ol eg ia we i fetalaes oli stak long bottom blong sowota bifo oli brok blong letemaot ol smolsmol larvae (bebe piko we oli no form gud yet). Olgeta oli flot long solwota blong 1 kasem 2 manis; aot long evri wan taosen bebe piko we i no fom gud yet, anda long wan nomo i save laef blong gro i kam wan pikinini piko.

Ol pikinini piko plante taem oli grup tugeta blong kasem bed blong si gras, kaen grup ia oli kolem bait ball. Aot long evri hundred pikinini piko, anda long wan bae i save laef blong 2 yia o mo bifo hemi save kam bigwan blong mekem pikinini.



## Fasin blong kasem piko

**Piko oli save kasem long ol defren wei blong fising:**

- Yusum spia long naet taem fis i stap kwaet nomo, i no muv, long bed blong si gras.
- Gill net mo beach seine oli stap yusum blong kasem ol grup blong fis we oli stap kakae mo long taem we oli grup blong spawn.
- Ol net we hol blong olgeta i smol, ol cast net mo ol seine net oli stap yusum blong kasem ol bait ball o grup blong ol pikinini piko.
- Huk mo laen wetem bet oli stap yusum, no mata we piko i kakae ol plant nomo.

Plante piko ol fisa oli kasem long taem we oli stap long grup blong mekem pikinini (long spawning aggregation). Kaen fising ia i no gud from i save mekem namba blong fis i go daon plante. Minim se namba blong ol fis we oli mekem pikinini i go daon mo oli bonem smol namba blong fis blong kasem long fiuja.



## Ol kaen fasin blong manejmen we yu save jusum

I gat sam kaen fasin blong manejmen we oli bin yusum wetem piko.

Oli bin yusum ol minimam saes limit long plante aelan blong Pasifik be i no klia se kaontri i save mekem sua se ol fising komiuniti we i stap long wan longfala kos laen i save folem wan nasonal rul olsem. Oli bin putum ol limit long hamas fis yu save kasem, be fasin ia i no gat gudfala pepos sapos komiuniti i no plan blong salem ol fis.

Long sam komiuniti oli blokem ol fisa blong no fis long naet wetem spia from i isi tumas blong tekem ol fis taem oli stap slip long si gras.

Long sam eria, ban long gill net we komiuniti i putum hemi bin protektem ol piko from oli no save tekem tumas long taem we oli muv blong go long ples blong spawn mo long taem we oli grup tugeta blong spawn. Be blong blokem gill net fising blong oltaem hemi save spolem ol fisa from ol bigfala piko (sem mak wetem ol malet) oli had tumas blong kasem wetem ol nara metod. Nara wei blong kontrolem, hemi blong ristiktim yus blong ol gill net wetem ol smol hol tru long wan limit long saes blong hol blong net blong mekem sua se i no smol tumas.

Blong mekem wan tabu eria maet i alaoem ol namba blong fis blong go antap be i no protektem olgeta fis taem oli go aot long tabu eria blong go blong spawn mo long taem we oli stap tugeta blong mekem pikinini blong olgeta sapos i no gat eni nara fasin blong protektem olgeta.

Plante long ol fising komiuniti oli gat sam lokol save long taem mo ples blong spawning mo ol infomesen ia i minim se oli save yusum ol manejmen opsen ia:

- Putum ban long fising long eria we ol piko oli stap spawn (mekem pikinini) long hem, blong soem se komiuniti i gat sam kontrol long ol spawning site we maet i stap aot lelebet long olgeta.
- Putum wan ban long fising long taem we ikat fulap piko i stap mekem pikinini, we maet i minim se oli mas stopem fising blong smol taem insaed long evri wanwan manis from sam spisis oli luk se oli grup tugeta blong mekem pikinini long taem blong niumun.

Yu save putum wan long tufala o tufala tugeta fasin blong manejmen (antap) wetem wan ristikten long saes blong mesh blong net mo long sem taem protektem ol lokol si gras bed. Maet hemia i bes samting we komiuniti i save mekem blong mekem sua se fiseriss blong piko i stenebol.

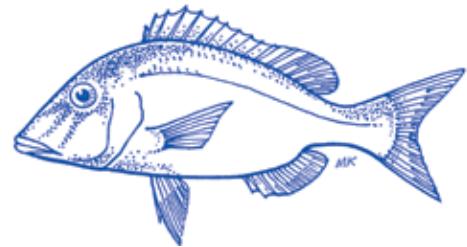




#03

# Red maot

## Emperor (Lethrinidae)



**Yelo-tel redmaot**  
Pacific yellowtail emperor  
(*Lethrinus atkinsoni*)



**Blakspot redmaot**  
Thumbprint emperor  
(*Lethrinus harak*)



**Rednek redmaot**  
Trumpet emperor  
(*Lethrinus miniatus*)



**Spankled redmaot**  
Spangled emperor  
(*Lethrinus nebulosus*)



**Yelostraep redmaot**  
Orange-striped emperor  
(*Lethrinus obsoletus*)



**Yelolip redmaot**  
Yellowlip emperor  
(*Lethrinus xanthochilus*)



### Spisis mo distribiusen

Insaed long famli blong ol Lethrinidae i gat maet 20 defren spisis blong redmaot we oli faenem long ol tropikol wota long Indian Osen mo Pasifik Osen.

Ol samting we i komon long ol spisis ia i ol tik lip, strong jo mo jik we i no gat skel.

I gat tu komon spisis we i stap long ol aelan blong Pasifik. Wan, we oli singaotem hem spangled emperor, i *Lethrinus nebulosus*, we i gat ol blu spot long bodi blong hem mo blu laen andanit long ae blong hem. Nara wan, we oli singaotem hem sweetlip emperor, i *Lethrinus miniatus*, we i gat wan grei bodi wetem kala red klosap long ae, maot mo fin blong hem.



### Ples we fis i stap long hem mo kakae blong hem

Plante spisis blong kaen fis ia redmaot oli stap laef long ol korel rif or long ol eria we i klosap long rif, olsem ples we i gat sandbis mo ol bed blong si gras long ol lagun.

Sam spisis oli stap laef long rif blong ston we oli go daon kasem 200 mita anda long wota. Ol pikinini blong sam spisis oli laef long ol eria blong si gras we wota i salo mo long ol eria blong natongtong.

Ol redmaot ia oli ol fis we oli stap kakae ol samting we oli stap daon long botom blong solwota olsem si snel, krab, si ejen, wom mo plante nara animol we i stap daon long botom blong solwota. Sam long ol bigfala spisis oli stap kakae sam nara fis. Be sam bigfala fis olsem sak i kakae ol spisis blong redmaot.





#03

# Red maot Emperor (Lethrinidae)

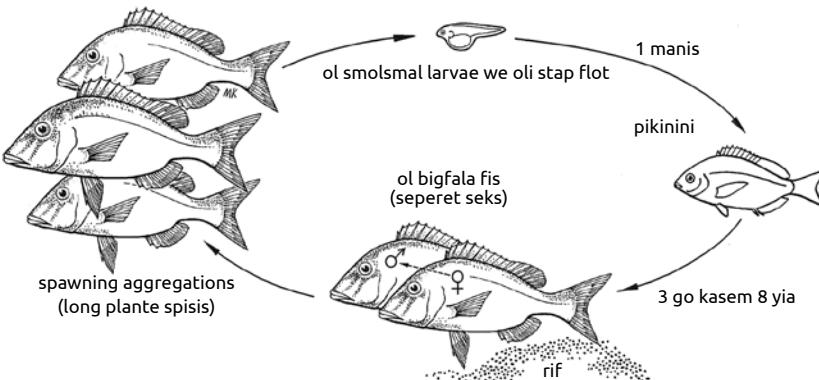


## Riprodakson mo saekol blong laef

Plante spisis blong redmaot oli bon olsem woman fis ( $\text{♀}$ ) mo oli jenisem seks i go long man fis ( $\text{♂}$ ) taem oli stap kam antap. Ol spisis blong redmaot oli save mekem pikinini long taem we oli kasem 30 to 50 pesen long laef blong olgeta. Spangled emperor, olsem wan eksampol, i save gru kasem wan maximam blong 90 sentimita ova long wan laef span blong 25 yia mo hemi save mekem pikinini taem hemi kasem wan longfala blong 45 sentimita long 8 go kasem 9 yia.

Olgeta i save grup tugeta blong spawn long taem blong niu mun o fulmun long sam manis. Ol grup ia maet i kam tugeta long ol difren ples, olsem long saed blong rif we oli stap aotsaed (barrier reef), mo long ol pasis o ples we wota i go insaed long rif. Wanwan woman fis i save letemaot plante taosen eg mo ol spem blong ol man fis i save fetalaesem olgeta.

Long klosap evri spisis blong redmaot, ol eg we i fetalae finis i save brok afta wan o tu dei mo letemaot ol smolsmol larvae we oli flot long taed long wan manis. Long evri taosen larvae, anda long wan i save laef blong kasem wan rif mo laef olsem pikinini fis long hem. Mo aot long evri hundred pikinini fis, anda long wan i save laef tru long 8 o 9 yia blong kam wan bigfala fis we i save mekem pikinini.



## Ol kaen fasin blong manejmen we yu save jusum

I kat sam kaen fasin blong manejmen long saed blong fising from redmaot olsem limitim namba blong ol man we oli fising, limitim hamas fis blong kasem (bag limit or quota), mo blokem kaen tul blong fis we oli save yusum. Ol fasin blong manejmen ia oli yusum long bisnis blong fising blong winim plante mani i bitim long fiseriss we i blong komiuniti nomo.

Sam long ol aelan kaontri blong Pasifik oli putum minimam saes (long 15 go kasem 25 cm long tip blong maot go kasem medel blong tel) be, long plante eksampol, rul i no talem klia wiswan saes limit i aplae long wiswan spisis blong redmaot. Taem we yumi luk long ol defren saes blong ol defren spisis blong redmaot, olgeta saes limit i no save aplae gudwan long ol spisis we i bigwan. Oli no save protektem ol spisis olsem spangled emperor, we hemi no mekem pikinini go kasem taem we hemi kasem wan saes blong 45 sentimita. Blong mekem se saes limit i wok gud, oli sud putum ol saes limit long wanwan spisis.

From se ol redmaot i statem laef olsem woman fis fastaem mo jenis i go long man fis, plante long ol smolsmol redmaot we oli kasem oli ol woman fis mo ol big wan oli ol man fis. Taem we oli kasem ol bigwan nomo we i folem rul blong saes i livim plante blong ol woman fis be fiu nomo long ol man fis long solwota.

Long saed blong komiuniti, stret fasin blong manejem ol redmaot hemi blong protektem ol bigfala fis we i rere blong mekem pikinini. Wan tabu eria we komiuniti i manejem i no save protektem ol fis we oli muv blong go long wan nara ples blong mekem pikinini. I gud sapos komiuniti blong yu i gat wan ples blong spawning, we komiuniti i save wok tugeta blong mekem i kam wan tabu eria.

Plante fising komiuniti oli save gud long taem mo ples blong fis i kam waples blong mekem pikinini mo infomesen ia oli mekem ol fasin blong manejmen olsem i posibol:

→ Wan ban long fising we i stap oltaem long eria o ples we spawning grup i save stap long hem, we i save soem se komiuniti i gat sam kontrol ova long spawning eria, we samtaem i save stap aot long eria blong komiuniti.

→ Wan ban long fising we i stap long taem blong spawning; from redmaot oli spawn long sam taem folem saekol blong mun, hemia i minim se i mas gat plante smol ban long ol stret taem.



## Fasin blong kasem fis

Ol fasin blong kasem redmaot i inkludim:

- huk mo string wetem bet
- fising wetem spia (masket, raba) long dei
- seine net mo cast net we oli yusum long ol salo lagun
- gill net we hemi men fasin blong fis mo plante taem oli yusum long ol grup blong spawn

Ol fisa oli kasem plante redmaot taem oli stap long ol bigfala grup blong mekem pikinini (long spawning aggregation). Kaen fising olsem i save katemdaon bigwan namba blong ol bigfala fis we olgeta nao bae oli mekem ol smolsmol fis, we plante long olgeta bae oli gru mo ol fisa i save stap blong kasem olgeta long fiuwa.

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The Locally-Managed Marine Area (LMMA) Network  
Improving the practice of marine conservation



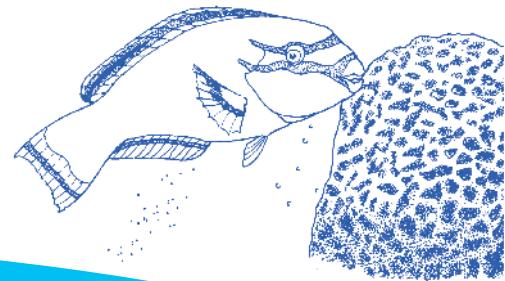
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#04

# Blu fis

## Parrotfish (Scaridae)



**Stoned parotfis**  
Green humphead parrotfish  
(*Bolbometopon muricatum*)



**Spoted parotfis**  
Spotted parrotfish  
(*Cetoscarus ocellatus*)



**Deisy parotfis**  
Daisy parrotfish  
(*Chlorurus sordidus*)



**Stippled parotfis**  
Steephead parrotfish  
(*Chlorurus microrhinos*)



**Dakap parotfis**  
Darkcapped parrotfish  
(*Scarus oviceps*)



### Spisis mo distribiusen

I kat ova long 90 spisis blong fis ia we stap long famli Scaridae we yumi save olgeta olsem blufis o parrotfish.

Famli blong ol blufis oli bin divelop wetem plante defren kaen kala, mo tut blong olgeta i joen olsem maot blong pijin ia nasiviru. Mos long olgeta spisis oli gru kasem 30 go kasem 50 cm. Spisis blong blufis we i mo big bitim ol nara wan, green humphead parrotfish, *Bolbometopon muricatum*, i save gru kasem 1.3 m long mo wet blong hem i save kasem 46 kg. Blufis i stap long ol salo solwota blong tropik raon long wol mo plante nao oli faenem long Indian mo Pasifik Osen.



### Ples we fis i stap long hem mo kakae blong hem

Blufis i stap long ol kos we i gat plante ston mo long ol bed blong si gras mo tu long ol koreli rif.

Long naet oli slip insaed long ol hol afta we oli bin kavremap olgeta wetem wan web we yu save luk tru long hem we oli mekem wetem spet blong olgeta. Web blong spet ia i save blokem ol bebet mo haedem smel blong blufis ia from ol fis we oli stap kakae ol nara fis long naet. Men ples long saekol blong laef blong blufis hemi koreli rif, mo long plante spisis, ol eria we oli kam tugeta blong mekem pikinini (spawning eria), we plante taem i long slop long aotsaed blong rif o long ol kanal.

Wetem ol tut we i joen, blufis i save skrasem koreli blong kakae ol plant we i stap long hem mo sam oli save kakae ol smolsmol plant (zooxanthellae) we i stap laef insaed long koreli. Taem oli skrasem aotsaed blong koreli oli solem daon sam blong hem, mo koreli ia i helpem blufis blong brekem ol pis blong plant we i stap insaed long bel blong hem. Oli save kakae plante koreli blong karem smol amaoon blong kakae mo sem taem oli gohed blong givim aot ol smolsmol pis koreli we i stap kam olsem sanbis. From wan blufis i save givimaot 90 kilo blong ol smolsmol pis koreli olsem doti blong hem long evri yia, blufis ia i kontribuit bigwan long sanbis blong ol lagun mo long ol tropikal so. Kaen fasin ia blong kakae olsem i blokem koreli blong i no ded from ol plant we i save kavremap mo kilim hem. Ol fis we i stap kakae ol blufis hemi inkludim ol namarae, redmaot mo plante kaen bigfala fis long rif.





#04

# Blu fis Parrotfish (Scaridae)

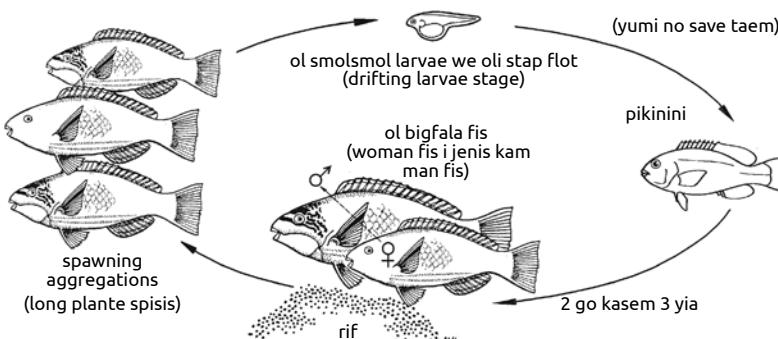


## Riprodaksen mo saekol blong laef

Klosap evri spisis blong blufis i bon olsem woman fis (♀) mo afta i jenis i go long braet grin o blu kala man fis (♂). Sam spisis oli save gru hariap, oli save mekem pikinini insaed long 2 o 3 yia, mo oli gat wan laef span blong 5 kasem 6 yia. Be ol bigfala spisis oli save gru mo slo mo kasem 15 yia o antap.

Sam spisis blong blufis oli save muv i go long wan eria blong grup tugeta long wan bigfala grup blong mekem pikinini. Insaed long grup ia, wanwan woman fis i letemaot plante taesen eg we sperm blong man fis i fetalesem olgeta.

Insaed long 25 haoa, ol eg we i fetales finis oli brok mo letemaot ol smolsmol larvae; longfala blong olgeta i olsem wan milimita. Oli float long solwota blong wan taem we yumi no save bifo oli setel long ol korel rif.



## Ol kaen fasin blong manejmen we yu save jusum

I gat sam fasin blong manejmen blong ol blufis olsem minimam saes limit we oli bin aplae long sam long ol aelan blong Pasifik, we i nogud tumas long ol spisis we oli jenisim seks from woman fis i go long man fis taem we oli stap gru. Sipos we folem loa ol fisa i save kasem ol bigfala fis nomo, ol fis we oli kasem bae i olgeta man fis nomo, we i livim tumas woman fis long populesen blong olgeta.

Oli bin putum wan limit blong hamas fis yu save kasem (quota o bag limit) long blufis be fasin blong manejmen ia i no stret tumas long ol fiseriss blong komiuniti. Sam kaontri oli putum minimam saes blong hol long ol gill net mo oli blokem ol fisa blong no yusum ol tul blong pulum win anda long wota taem oli fising wetem spia.

Ol fis resev (ol tabu eria), sapos oli smol, plante taem oli no gud blong protektem blufis. Hemia from blufis i save swim ova long ol bigfala eria blong faenem kakae mo oli swim long wan longfala distens blong go long ples blong mekem pikinini.

Ol fising komiuniti oli gat sam lokol save long taem mo ples we ol fis igo long wan bigfala grup blong mekem pikinini mo informesen ia i mekem se oli save yusum ol kaen fasin blong manejmen olsem:

- putum wan ban blong fising long taem we fis i kam tugeta blong spawn, we maet i nidim blong klos blong smol taem plante taem long yia from sam long ol spisis oli ssave spawn bitim wan taem long evri yia;
- Putum wan ban long fising long ol spawning eria we oli save.

Sam long ol nara aksen we komiuniti i save mekem maet i inkludim:

- putum wan ban long spia fising blong kasem blufis long naet; sam komiuniti oli tekem aksen olsem finis from fasin ia blong fis hemi tekem olgeta bigfala blufis aot long lokol fising eria blong olgeta.
- putum wan ban long yusum ol gill net we ol hol i smol tumas, net blong pulum (drag net) o wan beach seine net we saes blong hol i no kasem 50 milimita taem oli pulum gud. Ban blong kaen net ia i save help blong kasem ol big fis nomo mo ol smol fis oli save kam aot long net blong save gru bigwan mo mekem pikinini.



## Fasin blong kasem fis

We i save yusum blong kasem blufis i inkludim:

- gill nets – hemi wan komon fising tul blong kasem ol bigfala grup blong ol fis we oli stap mekem pikinini
- Spia fising – plante taem oli mekem long naet wetem toslaet taem fis i stap slip anda long korel.

Plante blufis oli save kasem olgeta taem oli stap long ol bigfala grup blong mekem pikinini (spawning group). Kaen fising olsem i save katemdaon bigwan namba blong ol bigfala fis we olgeta nao oli mekem ol smolsmol fis, we plante bae oli gru mo oli save stap blong oli kasem olgeta long fiuja.



Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmmanetwork.org](http://www.lmmanetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker



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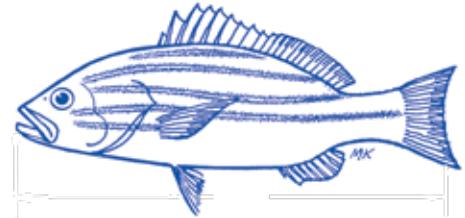




#05

# Rif snapa

## Reef Snapper (Lutjanidae)



**Natongtong snapa**  
Mangrove red snapper  
(*Lutjanus argentimaculatus*)



**Anglais snapa**  
Two-spot red snapper  
(*Lutjanus bohar*)



**Blaktel sone**  
Blacktail snapper  
(*Lutjanus fulvus*)



**Silo snapa**  
Humpback red snapper  
(*Lutjanus gibbus*)



**Kape snapa**  
Common bluestripe snapper  
(*Lutjanus kasmira*)



**Red straep snapa**  
Emperor red snapper  
(*Lutjanus sebae*)



## Spisis mo distribiusen

Fis ia we famli blong hem i Lutjanidae i gat ova long 100 spisis we oli stap long tropik mo sabtropik eria mo oli kolem ol kaen fis ia snapa.

Mos long ol spisis we oli gat intres long hem long ol inso fiseris blong ol aelan blong Pasifik i kamaot long genus grup Lutjanus, we hemi gat maet 60 spisis long hem. Wan long ol snapa we i stap long plante ples long Pasifik hemi bluestripe snapper, *lutjanidae kamira*, we i save gru kasem 30 cm. Spisis ia i stap long plante aelan long Pasifik mo oli karem igo long Hawaii long ol yia 1950.



## Ples we fis i stap long hem mo kakae blong hem

Plante snapa oli laef klosap long ol korel rif, be sam spisis oli faenem olgeta long ol eria we wota i no gat tumas sol long hem olsem klosap long maot blong ol riva.

Ol yangfala blong sam spisis oli stap grup long ol bed blong si gras o long ol eria blong sanbis, be ol fis we i mo big maet oli stap wanwan long ol korel rif. Plante spisis oli kam blong stap wan ples blong kakae raon long korel long ol aoa blong dei.

Ol snapa oli kakae ol smol fis, krab, ol smol naora mo si snel. I gat sam bigfala fis spisis we ol kakae ol snapa. Long sam ples, sam spisis olsem two-spot red snapper, *lutjanis bohar*, olgeta nao oli karem posen blong ciguatera. (Lukluk long infomesen long ciguatera long en blong sekseen blong ol toktok blong fiseris insaed long Gaed long ol Pepa blong Toksave.)





#05

# Rif snapa Reef Snapper (Lutjanidae)



## Reprodaksen mo saekol blong laef

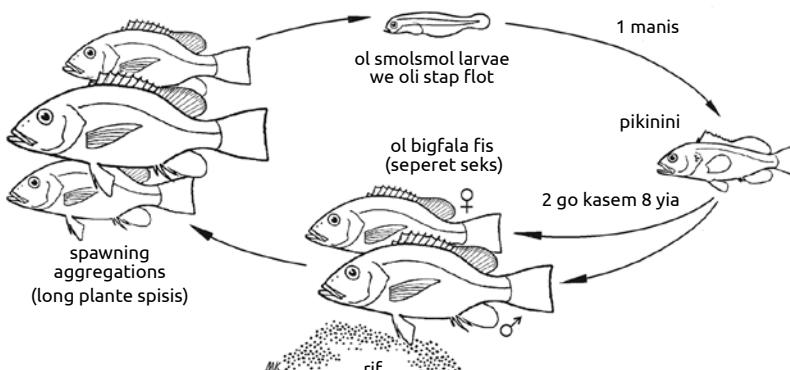
*Snapa oli gat seperet seks, wan fis i wan woman fis o i wan man fis be hemi no save jenis olsem sam nara kaen fis. Ol spisis we i smol oli save laef go kasem 4 yia mo ol bigfala spisis oli save laef i stap blong ova long 15 yia.*

Plante komon spisis oli save gru kasem 25 or 35 cm mo oli save mekem pikinini taem oli kasem 45 pesen blong maximam saes blong olgeta (hemia, 11 kasem 16 cm long ol komon spisis).

Ol snapa oli stap spawn truaot long yia long ol wota we i hot lelebet, be long ol manis we i hot lelebet nomo long ol kolkol wota. Plante snapa oli save swim long wan long distens blong go long wan eria long ol rif aotsaed mo ol kanal blong mekem pikinini, hemia long taem blong niu mun o fulmun.

Long taem blong mekem pikinini, ol woman fis ( $\varphi$ ) i givimaot eg (plante taem hemi ova long wan milian eggs) mo ol eg ia oli fetalaes wetem ol melek (sperm) we ol man fis ( $\sigma$ ) i kapsaetem. Long plante rif we snapa i stap long hem ol eg we i fetalaes oli brok wan o tu dei afta mo oli putumaot ol smolsmol larvae we oli flot wetem taed long maet wan manis. Aot long evri taosen smolsmol larvae, anda long wan i save laef blong setel long rif olsem wan pikinini fis.

Mo aot long evri hundred pikinini fis, anda long wan i save laef long wan taem blong 3 kasem 8 yia we i tekem olgeta blong kam man o woman fis we i rere blong mekem pikinini.



## Fasin blong kasem fis

*Plante taem oli save kasem snapa wetem huk mo han laen we i gat bet long hem be oli save kasem olgeta tu wetem spia, trap mo gill net.*

Plante snapa oli kasem olgeta taem oli stap long ol bigfala grup blong mekem pikinini (long ol spawning aggregation). Fising long taem ia hemi no stret from ol fis ia nao oli risponsibol blong mekem pikinini fis we oli save gru bigwan blong oli save kasem olgeta long fiuja.



## Ol kaen fasin blong manejmen we yu save jusum

Long sam kaontri oli putum ol minimam saes limit blong snapa (olsem eksampol, 30 sentimita we i longfala blong hem stat long tip blong maot kasem medel blong tel). Taem oli putum wan saes limit oli no talemaot wiswan spisis blong snapa oli minim. From we i gat plante spisis blong snapa we saes blong olgeta i defren, wan saes limit olsem hemi i no save protektem ol spisis we oli mo big. I gat nid blong putum saes limit long wanwan spisis.

Long sam kaontri oli blokem olgeta fis blong no yusum eni nara tul blong fis, be huk mo laen nomo. Long sam kaontri tu oli putum wan limit long hamas fis oli save kasem (bag limit). Be ol fasin blong manejmen i no stret long ol fiseriss blong komiuniti.

Maet komiuniti i save putum wan tabu eria, be i no save protektem olgeta fis we oli go long ol longfala distens blong mekem pikinini (long ol spawning site). Be sapos ol lokol fis a save ol ples mo taem we ol fis i go blong putum pikinini, maet oli save yusum ol fasin blong manejmen olsem:

- putum wan ban long fising long taem we ol fis ia oli grup tugeta, we maet i ol smol taem nomo (blong 3 o 4 dei) long taem we i gat niumun o fulmun.
- putum wan ban long fising long ol spawning eria we oli save, ol ples ia maet i inkludim sam stret eria long aotsaed blong rif mo long ol kanal we oli save se ol snapa i go blong mekem pikinini.

Sam nara komiuniti akseni i save inkludim:

- givim sapot long nasonal saes limit o, sapos i no gat, komiuniti i save putum sam minimam saes limit long maet 50 pesen blong maximam saes blong spisis ia.
- putum wan ban long ol fisa blong no yusum gill net we wan hol blong net i anda long 50 milimita. Maet ban ia i save letem ol smolsmol fis i ronwei mo gru long wan saes we i big inaf blong mekem pikinini.



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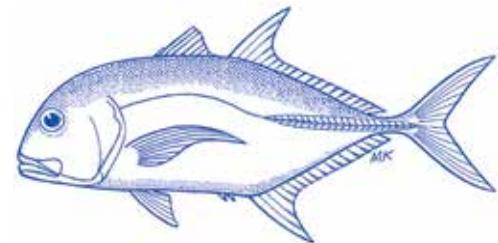
The Locally-Managed Marine Area (LMMA) Network  
  
Improving the practice of marine conservation





#06

# Karong Trevally (Caringidae)



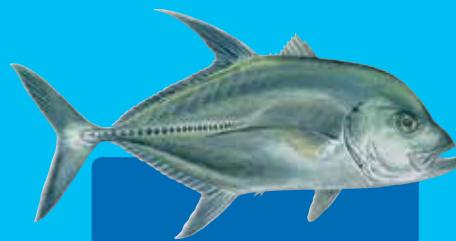
**Long nos karong**  
Longnose trevally  
(*Carangoides chrysophrys*)



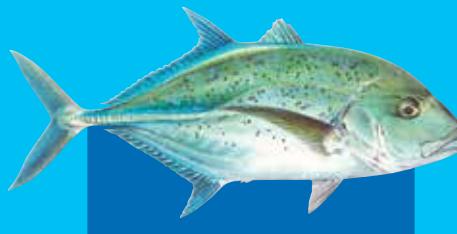
**Aelan karong**  
Island trevally  
(*Carangoides orthogrammus*)



**Blak karong**  
Giant trevally  
(*Caranx ignobilis*)



**Blak jak karong**  
Black jack  
(*Caranx lugubris*)



**Blu karong**  
Bluefin trevally  
(*Caranx melampygus*)



**Bigae karong**  
Bigeye trevally  
(*Caranx sexfasciatus*)



## Spisis mo distribiusen

Long famli blong Carangidae i gat 200 defren spisis blong karong, jack mo scad we oli stap long solwota long evri osen.

Plante spisis blong karong, olgeta we oli bigwan smol mo olgeta we oli bigwan olgeta, oli save faenem akros long Pasifik Osen go kasem Hawaii; olgeta i inkludim island trevally, *Carangoides orthogrammus* (longfala kasem 75 cm), Bluefin trevally, *Caranx melampygus* (90 cm), six-banded o bigeye trevally, *Caranx sexfasciatus*, (150 cm) mo - giant trevally, *Caranx ignobilis*, (160 cm).

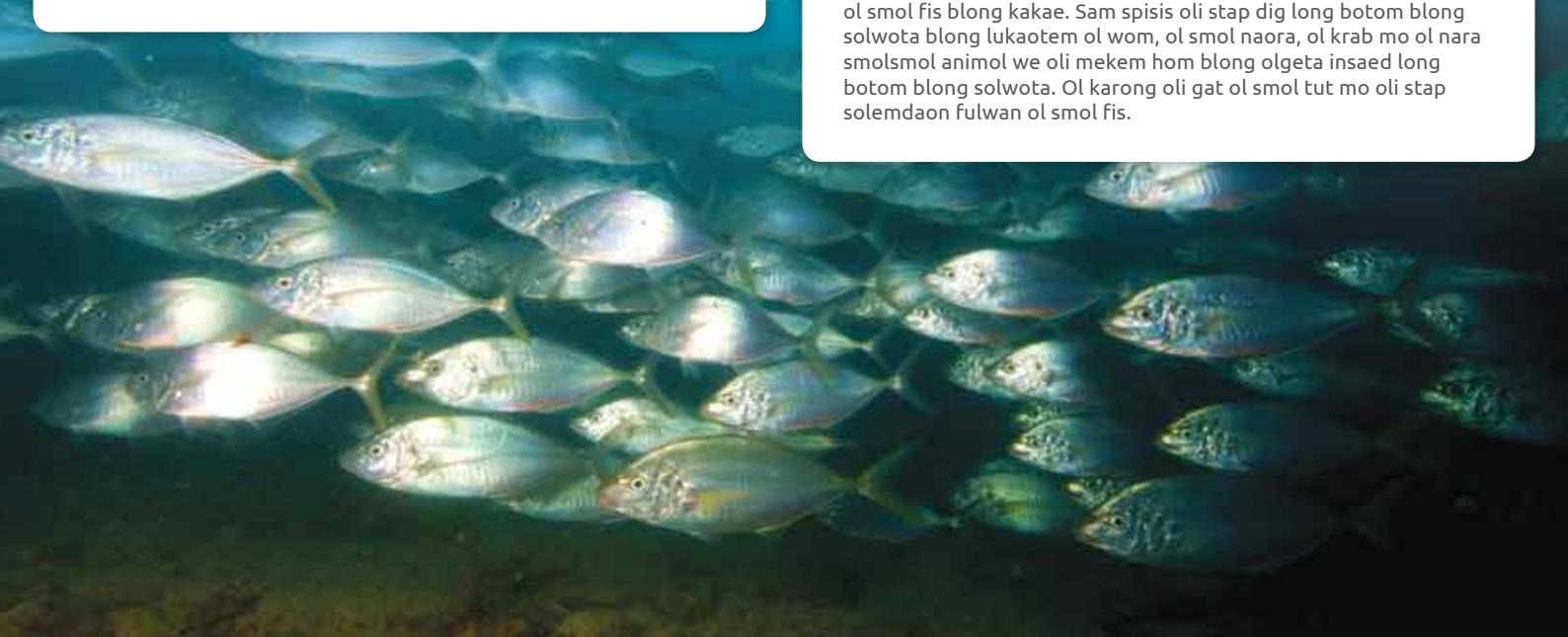


## Ples we fis i stap long hem mo kakae blong hem

Mos blong ol karong oli laef long plante kaen ples, olsem insaed long lagun or rif mo aotsaed long ol korel rif. Samtaem yu save faenem ol pikinini blong karong oli stap long wota we i no gat tumas sol long hem insaed long ol maot blong ol riva.

Plante long ol spisis blong karong oli no slip long naet from oli stap lukaotem kakae antap long solwota mo long botom blong solwota.

Ol karong oli olgeta fis we oli save swim kwik mo oli lukaotem ol smol fis blong kakae. Sam spisis oli stap dig long botom blong solwota blong lukaotem ol wom, ol smol naora, ol krab mo ol nara smolsmol animol we oli mekem hom blong olgeta insaed long botom blong solwota. Ol karong oli gat ol smol tut mo oli stap solemdaon fulwan ol smol fis.





#06

# Karong Trevally (Caringidae)



## Riprodaksen mo saekol blong laef

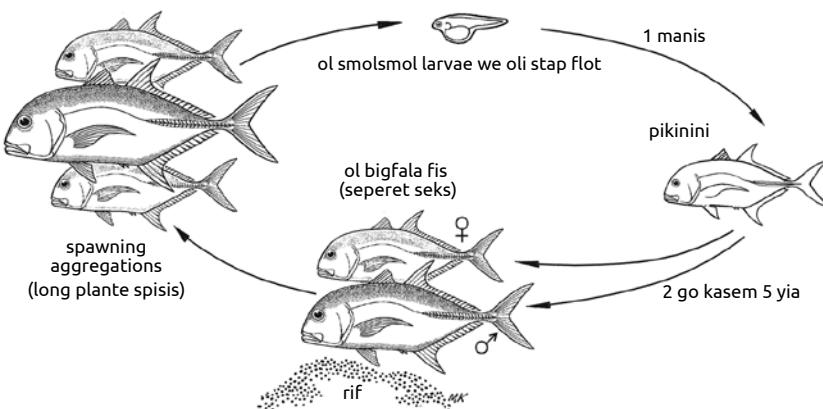
Ol karong oli gat seperet seks, olsem i gat woman fis mo man fis. Plante komon spisis oli luk se oli kasem taem blong mekem pikinini taem oli kasem wan longfala blong 35 go kasem 56 pesen blong maximam saes blong olgeta.

Blong tekem wan eksampol, ol bigbigfala karong (*giant trevally*) oli save gru kasem 160 cm mo 80 kg ova long wan laef span blong 24 yia mo i save mekem pikinini taem longfala blong hem i 60 kasem 95 cm taem oli gat 3 kasem 5 yia. Ol smol bluefin karong, we oli gru kasem 90 cm, oli save kasem taem blong mekem pikinini taem oli kasem wan longfala blong 30 kasem 40 cm long taem we maet oli gat 2 yia.

Plante spisis blong karong oli swim ova long wan long distens blong go mekem pikinini long wan bigfala grup (spawning aggregation). Ol eria we oli grup tugeta long hem (spawning site) plante taem oli stap long saed blong frinjing rif (rif we i fas wetem aelan) o klosap long ol pasis. Plante taem ol fis oli grup tugeta taem we wota i stap kam hot lelebet mo long ol taem we i folem saekol blong mun.

Long taem blong mekem pikinini, wanwan woman fis (♀) i givimaot plante taosen eg i go long solwota mo ol eg ia sperm we ol man fis (♂) i kapsaetem i fetalaesem olgeta. Ol eg ia we i fetalaes oli brok mo putumaot ol smolsmol larvae we oli stap flet long solwota long ova long wan manis. Long evri taosen smolsmol larvae, anda long wan nomo i save laef blong kam wan pikinini fis.

Taem ol larvae we oli flet oli kam olsem pikinini fis maet oli go insaed long ol wota we i no dip tumas klosap long so mo oli muv i go aot long ol rif we i mo dip taem oli gru. Aot long evri hundred pikinini blong karong, anda long wan i save laef go kasem 2 kasem 5 yia we i tekem hem blong kam wan bigfala fis we i save mekem pikinini.



## Ol kaen fasin blong manejmen we yu save jusum

Otoriti long sam long ol kaontri blong aelan blong Pasifik oli putum wan rul long saes limit long ol karong (olsem yu save karem karong we hemi 25 kasem 30 cm long stat long tip blong maot kasem medel blong tel).

Samtaem oli putum ol defren minimam saes blong ol scad mo ol karong we i mo smol, be plante taem oli no talemaot wiswan saes limit i aplae long wiswan kaen karong. From i gat ol defren saes blong wanwan spisis, saes limit i no save alaoem ol bigfala kaen spisis blong kasem taem blong mekem pikinini. Blong I wok gud, oli mas aplaem ol saes limit long wanwan spisis.

Sam long ol otoriti blong fiseriss oli save putum wan tabu long sison blong fis, be rul ia i had blong aplae long ol defren ples we ol karong oli gat ol defren taem mo eria blong grup tugeta blong mekem pikinini.

Ol tabu eria we komiuniti i manejem i no save protektum tumas ol karong from olgeta oli muv long wan rif i go long wan nara rif mo plante taem oli swim long wan longfala distens blong kasem ples we oli mekem pikinini. Plante lokol fisa olgeta i save long saed blong taem mo ples blong ol spawning aggregation, mo save ia i mekem se i gat sam fasin blong manejmen we i save wok gud, olsem:

- putum wan ban long taem blong sison we ol fis i grup tugeta blong mekem pikinini, we maet i blong ol smol taem nomo we i folem saekol blong mun.
- putum wan ban long fising long ol ples we fis i grup blong mekem pikinini, we maet i stap long saed blong rif o klosap long ol pasis blong rif; ol smolsmol larvae we i stap flet we ol fis i mekem maet oli stap setel long ol nara rif, inkludim ol eria we i open blong fising, hemia ol rif we oli stap long ples we taed i flo long hem.

Ol nara aksen blong komiuniti maet i inkludim:

- banem ol fising metod we i save kasem tumas fis olsem gill net;
- banem ol smol-mesh gill net, olsem gill net we wan hol blong net, taem yu pulum gud, ino kasem 50 milimita. Blong putum wan minimam net-mesh saes i minim se ol smolsmol fis i save ronwei mo gru kasem taem we oli save mekem pikinini.



## Fasin blong kasem fis

Karong oli save kasem olgeta taem oli yusum tolaen wetem ol lure we fakti i mekem, ol jig mo ol najarol bet. Gill net, cast net mo ol nara trap tu oli save yusum blong kasem karong. Karong oli impoten tu long saed blong fising olsem wan spot.

I gat ripot se sam spisis oli save afektem man wetem ciguatera posen. (Lukluk long en blong sekseen blong ol toktok blong fiseriss insaed long Gaed blong ol Pepa blong Toksave.)

Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmmanetwork.org](http://www.lmmanetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker



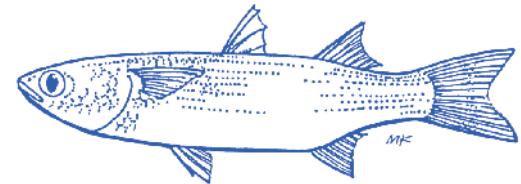
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#07

# Malet Mullet (Mugilidae)



**Bolfae malet**  
Fringlip mullet  
(*Crenimugil crenilabis*)



**Yelo tel malet**  
Squaretail mullet  
(*Liza vaigiensis*)



**Flathed malet**  
Flathead grey mullet  
(*Mugil cephalus*)



## Spisis mo distribiusen

Family Mugilidae hemi inkludim 80 defren spisis blong malet we oli stap long ol wota we i kolkol smol mo long ol tropikol wota raon long wol.

Ol malet oli gat tu seperet fin we i stap antap long bak blong olgeta, mo maot blong hem i olsem wan traekel. Kaen malet we komon nem blong hem i flathead o striped mullet, sam taem oli kolem sea mullet, *Mugil cephalus*, hemia men malet long Saot Pasifik. Spisis ia kala blong hem i wan grin we i dak long bak blong hem, mo silva long saed mo bel blong hem wetem seven laen we i dak long saed blong bodi blong hem.



## Ples we fis i stap long hem mo kakae blong hem

Ol bigfala malet oli laef long ol salo eria long kos, plante taem long oli grup we oli kolem skul, ova long sanbis, sofmad o bed blong si gras go daon kasem dip blong 10 m. Olgeta i save go insaed long ol riva be hemia i no minim se oli nidim riva wota.

Malet oli muvmuv plante long dei, long taem ia ol bigfala malet oli kakae ol plant mo smol animol (olgeta we oli no gat bon long baksae blong olgeta), mo oli pulum ikam long maot blong olgeta ol toti we oli stap long bed blong solwota. Plante taem olgeta oli go long ol grup blong kakae long ol smol plant we oli gru long ol si gras. Ol bigfala fish olsem ol snapa mo barakuta oli kakae malet olsem kakae blong olgeta.





#07

# Malets Mullet (Mugilidae)

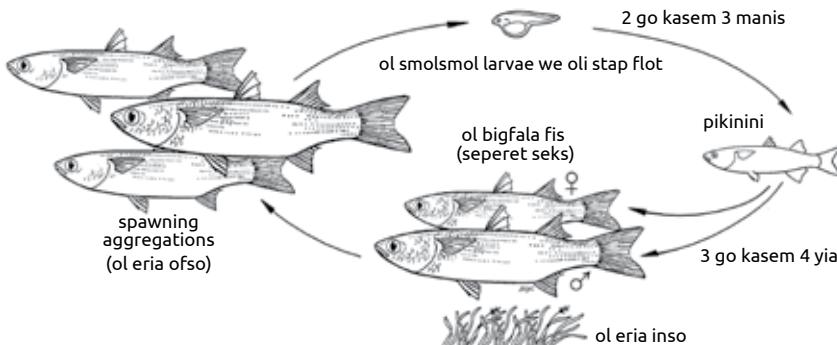


## Riprodaksen mo saekol blong laef

Malet i gat tu seperet seks, i gat woman fis mo man fis, mo oli rere blong mekem pikinini taem oli 3 kasem 4 yia long wan saes blong 30 sentimita. Olgeta oli save gru kasem wan longfala blong 60 cm mo wet blong 4kg mo sam oli save kasem 100 sentimita mo stap laef kasem 16 yia.

Evri yia ol malet i muv long wan longfala distens folem kos blong kasem ples we i dip lelebet blong mekem pikinini long grup. Long taem blong mekem pikinini, wan woman fis (♀) i givim aot plante eg, hemia i ova long 1 milian, mo ol eg ia sperm blong man fis (♂) we i kapsaetem i fetalaesem olgeta. Ol eg we i fetalaes oli brok mo putumaot ol smolsmol larvae we oli flot long solwota.

Afta long 2 go kasem 3 manis, aot long evri taosen smolsmol larvae, anda long wan i laef olsem pikinini fis mo i go swim igo long eria we wota i salo. Mo aot long evri hundred pikinini fis, anda long wan i save laef long 3 kasem 4 yia we i tekem hem blong gru mo kasem saes blong mekem pikinini.



## Fasin blong kasem fis

Plante taem ol fisa i kasem ol malet wetem cast net, gill net, bij seine net, ring net mo trap. Oli yusum ol trap wetem fanis we oli bildim long raet ankel long so blong pulum ol fis we oli grup i go blong mekem pikinini i kam insaed long wan bigfala ples we i save holem taet olgeta.

Oli save kasem ol bigfala namba blong malet from oli stap muv tugeta folem kos blong go mekem pikinini long grup. Fasin blong fising olsem i no gud from olgeta fis ia we oli go blong mekem pikinini i olgeta we bae oli mekem ol smolsmol fis, we aot long olgeta plante oli save gru mo stap rere blong oli kasem olgeta long fiuja.



Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmannetwork.org](http://www.lmannetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker



## Ol kaen fasin blong manejmen we yu save jusum

Ol fiseriss blong malet oli bin kontrolem olgeta wetem sam difren kaen rul.

From ol malet we i muv igo long kos evriwan i ol bigfala fis we i rere blong mekem pikinini mo evriwan i sem mak saes i no wokaot gudwan blong yusum ol saes limit. Blong yusum wan ban long saes blong hol blong net o trap fasin ia tu i no stret (from i gat smol namba nomo blong ol smol fis we i traem blong pas tru long hol blong net we hol ia i no damejem olgeta).

Oli bin putum tu ol limit blong namba blong fis we oli save kasem long wan taem (bag limit) be ol fis we oli kasem long ol bigfala net mo trap plante taem i plante tumas, mo olgeta we oli i letem aot olgeta we i antap long namba blong limit janis blong olgeta i save stap laef i smol nomo.

Blong setemap ol tabu eria we komiuniti i stap manejem i no save helpem tumas from ol fis ia oli muv olbaot plante (migrate) olsem ol malet mo i no save protektem olgeta fis ia taem oli stap muv long kos long grup blong mekem pikinini.

Wan long ol problem blong manejem ol fiseriss blong malet hemi from plante defren komiuniti i kasem olgeta fis ia taem ol muv folem kos (migrate). I no gat yus blong wan komiuniti nomo i protektem muvmen blong malet sipoz we komiuniti we i stap klosap long hem i stap kasem olgeta taem oli muv igo. I gud tumas sapos ol komiuniti i save wok waples blong yusum sem fasin blong manejmen. Fasin blong manejmen we oli sud agri long hem hemi blong letem inaf long ol malet blong kasem eria we oli go long hem blong mekem pikinini mo prodiusim ol smolsmol fis, we plante long olgeta i save gru blong kam bigfala fis we oli save kasem olgeta long fiuja.

Ol fasin blong manejmen we komiuniti i save wok tugeta blong mekem i save inkludim:

- putum wan ban long ol gill net mo fanis trap long taem blong muvmen blong ol malet we oli go blong mekem pikinini - we maet i no yusful tumas from malet i no isi blong kasem tru long eni nara fasin blong fising. Maet wan nara fasin we i save wok hemi blong:
- ristiktim namba mo saes blong fanis trap mo longfala blong gill net we ol fisa i alao blong oli yusum long taem blong muvmen blong malet (migration), we i save wok gudwan mo sapos oli mekem olsem:
- putum wan ban long ol gill net mo fanis trap long sam eria we oli save kasem evri malet long wan grup taem oli fising. Maet ol eria ia i save inkludim ol smol basis bitwin long so mo ol rif we grup blong malet oli mas pas tru long hem.



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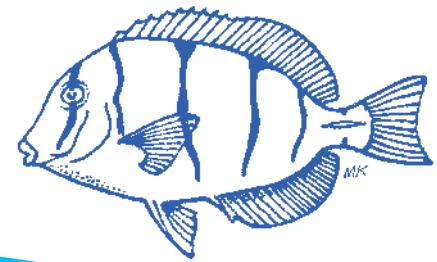
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#08

# Poket naef fis

## Surgeonfish (Acanthuridae)



Withespotted surgeonfish  
(*Acanthurus guttatus*)



**Renbo fis**  
Lined surgeonfish  
(*Acanthurus lineatus*)



**Black straep poketnaef fis**  
Convict surgeonfish  
(*Acanthurus triostegus*)



**Yelo pektrolfin poketnaef fis**  
Yellowfin surgeonfish  
(*Acanthurus xanthopterus*)



**Orenj spot poketnaef fis**  
Striated surgeonfish  
(*Ctenochaetus striatus*)



**Sanpepa fis**  
Bluespine surgeonfish  
(*Naso unicornis*)



### Spisis mo distribiusen

*Acanthuridae hemi famli blong ol poketnaef fis, mo ol tang mo yunikonfis. Famli ia i gat 80 spisis we oli laef long solwota long tropik.*

Evri poketnaef fis i gat wan or moa sap nil o bled we i stap long tufala saed blong tel blong hem.

Plante poketnaef fis oli medel saes (25 go kasem 40 cm) be sam long ol yunikonfis oli kasem longfala we isave bitim wan mita. Sam spisis oli impoten kaen fis blong kakae olsem ol convict surgeonfish, *Acanthurus triostegus*, ol lined surgeonfish, *Acanthurus lineatus*, mo ol striated surgeonfish *Ctenochaetus striatus*.



### Ples we fis i stap long hem mo kakae blong hem

*Plante poketnaef fis oli stap long ol ples we igat korel rif mo plante taem oli stap fomem ol bigbigfala grup taem oli stap kakae long ol korel mo ston long ples we wota i salo.*

Ol stret ples we i impoten tumas long saekol blong laef blong plante long ol poketnaef fis hemi ol ples we oli stap grup tugeta blong mekem pikinini. Ol maot blong poketnaef fis i smol wetem wan laen blong tut nomo we oli yusum blong skrasem ol plant aot long korel mo ston.





#08

# Poket naef fis Surgeonfish (Acanthuridae)



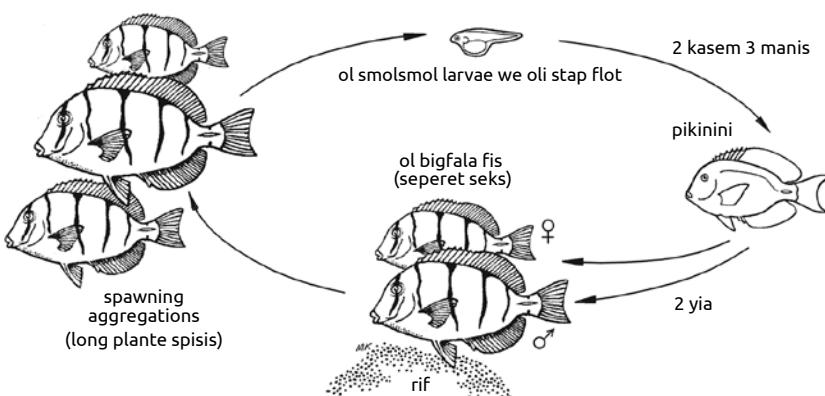
## Riprodaksen mo saekol blong laef

Ol poketnaef fis oli gat seperet seks, minim se i gat woman fis mo man fis, mo plante medel saes fis blong spisis ia oli i gat ol laef saekol we klosap i sem mak. Blong givim wan eksampol, mos long ol convict surgeonfish oli kasem 17 sentimita (wetem wan maximam blong 27 sentimita) mo oli save laef go kasem 4 yia o mo. Ol man fis mo ol woman fis i save kasem taem blong mekem pikinini long ol defren saes, olsem woman fis i rere blong mekem pikinini taem hemi klosap maximam saes blong hemi taem hemi gat 2 yia.

Plante poketnaef fis oli stap grup tugeta (long ol spawning grup) taem solwota i hot smol mo taem we i gat fulmun. Spawning eria oltaem i stap aot-saed long ej blong rif we i joen wetem aelan o klosap long ol pasis long rif.

Long ol ples blong mekem pikinini, wan woman fis (♀) i save givim aot plante milian blong ol smolsmol eg i go long wota, mo olgeta oli fetalaes wetem sperm we ol man fis (♂) i kapsaetem. Ol eg mo sperm ia oli luk waet olsem klaod insaed long solwota mo plante fis oli stap kam blong kakae olgeta. Aot long ol eg we i fetalaes ol smolsmol larvae i kamaot mo flot long solwota long 2 kasem 3 manis. Aot long wan taosen eg, anda long wan smolsmol larva i save laef blong kam pikinini fis we hemi samting olsem 3 sentimita long longfala blong hem.

Mo aot long wan handred pikinini fis, anda long wan i save laef blong 2 yia o mo blong kasem taem blong mekem pikinini.



## Ol kaen fasin blong manejmen we yu save jusum

Nasonal fiseris otoriti long sam aelan blong Pasifik oli putum minimam saes limit long ol poketnaef fis (olsem wan eksampol, wan longfala blong 20 sentimita stat long tip blong maot kasem medel blong tel) be oli no aidentifaem stret spisis we rul ia i aplae long hem. Sapos oli wantem se rul ia i wok gud, oli mas aplaem saes limit long wanwan spisis.

Blong mekem se ol namba blong ol poketnaef fis i save sastenabol i gud blong protektem ol bigfala fis we oli rere blong mekem pikinini. Ol tabu eria we komiuniti i manejem maet oli alaoem ol poketnaef fis blong gru, be, from mos long ol spisis oli stap muv aot i go long ol ples blong mekem pikinini, oli no save protektem olgeta fis ia.

From we plante fising komiuniti oli gat sam lokol save long taem mo ples we ol fis i go blong mekem pikinini, i gat sam fasin blong manejmen we i posibol, olsem:

- putum wan ban long fising long taem we fis i mekem pikinini; maet oli nidim blong putum sam smol taem nomo blong klosem fising taem ol fis i grup tueta. Sapos ol spisis blong manejem oli grup tueta long taem blong fulmun, i gud tumas sapos oli stopem fising long fiu dei bifo mo afta long fulmun.
- putum wan ban long fising long ol ples we ol fis oli stap go grup long hem, we maet hemi aot-saed ej blong rif o klosap long ol pasis.

Ol aksen olsem i save givim sam proteksen long ol fis we oli go blong mekem pikinini. Mo taem ol smolsmol larvae oli kamaot long ol eg mo flot long solwota long 2 kasem 3 manis, maet oli go stap long ol rif we i stap raon, inkludim ol fising eria, eespeseli long ples we taed i save pulum olgeta.

Wan nara aksen we komiuniti i save tekem hemi blong putum wan ban long ol net we hol blong olgeta i smol tumas, blong protektem ol pikinini fis.



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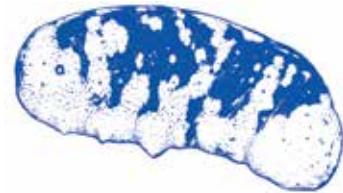




#09

# Si-kukamba/Besdemea

## Sea Cucumber (Holothurians)



**Waet titfis**  
White teatfish  
(*Holothuria fuscogilva*)



**Sanfis**  
Sandfish  
(*Holothuria scabra*)



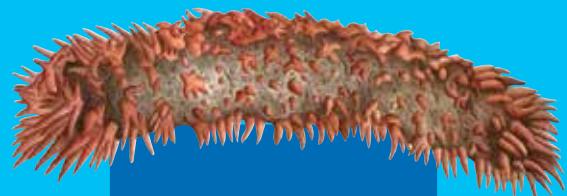
**Blak titfis**  
Black teatfish  
(*Holothuria whitmaei*)



**Krifis**  
Greenfish  
(*Stichopus chloronotus*)



**Karifis**  
Curryfish  
(*Stichopus herrmanni*)



**Paenapolpis**  
Prickly redfish  
(*Thelenota ananas*)



### Spisis mo distribiusen

Si-kukamba oli gat strong skin mo wan bodi we sep blong hem i olsem wan kukamba. Long samwea long taosen o mo spisis blong si-kukamba we i stap raon long wol, i gat 35 we oli impoten long saed blong tred long rijen blong Esia-Pasifik. Sam spisis we oli ekspotem olgeta taem oli bin boelem, smokem mo draem olgeta oli givim nem long olgeta bêche-de-mer o trepan.

Ol si-kukamba oli putum igo long tri grup we hemi dipen long valiu blong olgeta – lo, medel o hae. Hae valiu grup hemi inkludim waet teatfish, *Holothuria fuscogilva*, black teatfish, *Holothuria whitmaei*, sandfish, *Holothuria scabra*, mo prickly red fish, *Thelenota ananas*.

Spisis we i stap long medel mo lo valiu grup oli stap jenis oltaem taem i gat maket blong olgeta mo praes blong olgeta i stap go antap. Wan smol buk blong aedentifaem spisis blong si-kukamba i stap long SPC ([www.spc.int](http://www.spc.int)).



### Ples we si-kukamba i stap mo kakae blong hem

Si-kukamba i wan impoten pat blong ol laef blong korel rif. Sam spisis oli stap long ol salo lagun, mo long bed blong si gras mo long rif flat, be i gat sam we oli laekem stap long ples we ol wef i stap brok long hem mo ol pasis we i dip. Si-kukamba i save muv sloslo ova long ol eria blong sandbij long ol lagun mo oli stap kakae ol plant mo animol we i ded finis we ol stap long sanbij. Taem wan si-kukamba i stap kakae, hemi swolem sanbij, mo hemi kakae ol kakae we i miks wetem sanbij, afta we hemi pasemaot sanbij we i klin bihaen. From risen ia ol si-kukamba oli impoten tumas blong klinim mo tantanem sanbij long bed blong solwota.





#09

# Si-kukamba/Besdemea Sea Cucumber (Holothurians)

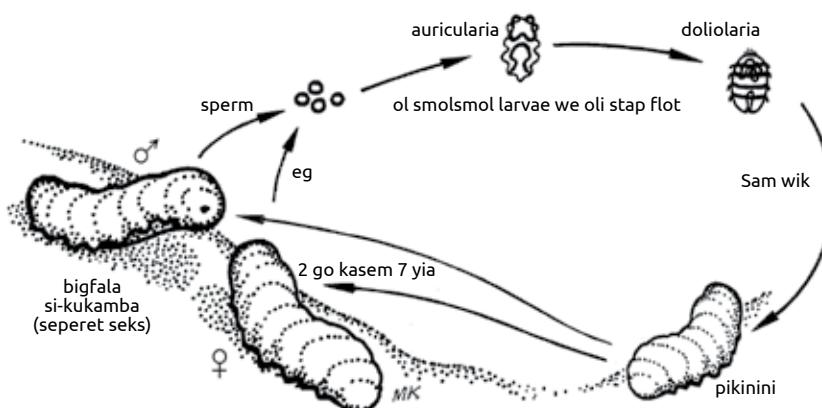


## Riprodacksen mo saekol blong laef

Mos long ol kaen si-kukamba we oli salem oli gat seperet seks, minim se i gat man wetem woman si-kukamba. Sam spisis, olsem sanfis, oli gru hariap mo kasem saes blong mekem pikinini maet insaed long wan yia or mo be i tekem nara tu yia blong kasem saes blong oli save salem long maket. Ol nara spisis oli gru sloslo mo oli save laef long 5 go kasem 15 yia.

Plante spisis we i stap long tropik oli mekem pikinini long taem we ol manis i stat blong hot lelebet. Sam spisis, olsem black teatfish, oli mekem pikinini long ol kolkol manis. Long taem blong mekem pikinini (spawning) woman si-kukamba (♀) i givim aot eg blong hem igo long wota mo ol man si-kukamba (♂) i feta-laesem olgeta wetem ol sperm blong olgeta we olgeta i kapsaetem. Saksesful riprodaksen i dipen long bigfala namba blong si-kukamba we oli stap tugeta long sem ples.

Ol eg we i fetaaes oli brok mo oli aotem ol smolsmol larvae we oli stap flet wetem taed blong solwota blong sam wik; mo, aot long evri taosen larvae, anda long wan i save setel long bed blong solwota olsem wan pikinini si-kukamba. Si-kukamba oli no muv igo longwe tumas long eria we oli kam stap long hem fes taem mo, aot long evri hundred pikinini, anda long wan i save stap laef mo gru blong kam bigwan rere blong mekem pikinini.



## Ol kaen fasin blong manejmen we yu save jusum

Plante fiseriss otoriti oli putum wan minimam saes limit long ol si-kukamba. From si-kukamba i stap go smol taem oli prosesem, minimam saes oli givim long ol si-kukamba we i laef mo olgeta we oli drae finis. Minimam saes blong ol defren spisis i stap long aedentifikesen kad blong ol si-kukamba we i stap long SPC.

Long sam eria, nasonal otoriti oli blokem fising blong si-kukamba blong alaoem populesen blong hem i kambak. Ol nara otoriti oli putum wan ban long ekspot blong sam spisis blong si-kukamba.

Antap long sapotem ol nasonal regiulesen, komiuniti i save tekem ol aksen olsem:

- putum wan ban long ol tul blong pulum win anda long solwota, olsem SCUBA, long ol fising eria blong komiuniti; fasin ia hemi bin mekem se namba blong si-kukamba i bin go daon plante.
- putum tabu o ban long koleksen blong si-kukamba, we maet i gat nid long hem long taem we namba blong olgeta i bin go daon plante. Tabu olsem i mas gat det blong statem mo det blong openem baken, from i nidim sam yia blong givim taem blong ol stok blong si-kukamba i go antap mo blong olgeta bigwan i save mekem pikinini.
- setemap wan sistem blong havestem ol si-kukamba, minim se wan komiuniti i save haves tem ol si-kukamba blong hem long wan yia mo afta i taem blong wan nara komiuniti. Yumi talem se i go raon long wan rotesen. Sapos komiuniti i gat wan big eria blong fising long hem, i gud blong divaedem eria ia long fo o faev eria we i mo smol. Long Fasin ia, komiuniti i save alaoem koleksen blong si-kukamba long wan eria nomo long wan yia, mo afta alaoem fising long nara eria long ol nara yia. I nidim bigfala namba blong ol smol eria blong mekem olsem, from populesen blong si-kukamba i gru slo tumas.
- setemap ol smolsmol tabu eria blong komiuniti. From si-kukamba i no muv igo long we tumas, tabu eria i save stap bitwin 0.5 km<sup>2</sup> mo 3 km<sup>2</sup>. From taem we ol larvae blong si-kukamba i stap flet i longfala, ol pikinini blong hem oli save seraot long sam eria aotsaed long tabu eria. Hemia i soem se Fasin olsem i stret.
- wok wetem ol komiuniti klosap blong setemap wan netwok blong tabu eria blong si-kukamba folem solwota.



## Ol fasin blong kasem ol si-kukamba

*Blong karem si-kukamba oli save kolektem wetem han taem taed i lo o oli save daeva from. Blong daeva wetem gas o nara tul blong pulum win hemi tabu long Vanuatu from i save daonem populesen blong si-kukamba.*

Long sam aelan long Pasifik, ol gat mo ol riprodaktiv pat blong wan si-kukamba, we samtaem oli brok mo ol stap sting long solwota, ol pipol oli laekem kakae. Oli katem open bodi blong wan spisis olsem curryfish, *Stichopus herrmanni*, mo karemaot ol gat blong hem: afta oli karem si-kukamba ia i go bak long solwota from oli bilivim se hemi save gruem ol gat blong hem baken.



Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmmanetwork.org](http://www.lmmanetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker



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# 10

# Natalae

## Giant Clams (Tridacnidae)



**Sanbis natalae**  
Bear paw giant clam  
(*Hippopus hippopus*)



**Korel natalae**  
Elongate giant clam  
(*Tridacna maxima*)

**Ston natalae**  
Fluted giant clam  
(*Tridacna squamosa*)

**Smol natalae**  
Crocus giant clam  
(*Tridacna crocea*)



### Spisis mo distribiusen

Famili blong natalae ia Tridacnidae i inkludim sam spisis we oli kolem ol giant clam, we oli stap long ol difren ples long Indian mo Pasifik Osen.

Spisis ia ol saes blong olgeta oli defren, stat long sam we oli smol, oli 15 cm nomo, nem blong olgeta i crocus giant clam, *Tridacna crocea*, go kasem ol stret giant clam, *Tridacna gigas*, we oli save gru kasem wan longfala blong 1 mita mo wan wet we i save ova long 200 kilogram.

Elongate giant clam, *Tridacna maxima*, hem nao hemi stap long plante ples aot long ol nara natalae long Pasifik, mo nara wan hemi Fluted giant clam, *Tridacna squamosa*. Long ol spisis ia, kala blong mit we yu save lukim taem sel i open (mantle blong hem) i braon mo haf red mo blu go kasem yelo mo grin. Natalae we i sidaon long sanbij nomo, bear paw giant clam, *Hippopus hippopus*, hemi save gru kasem 40 cm, kala blong mit blong hem i yelo wetem haf blak.



### Ples we natalae i stap long hem mo kakae blong hem

Elongate giant clam, *Tridacna maxima*, mo crocus giant clam, *Tridacna crocea*, i luk se oli stap berem insaed long ol korel o ston, mo sel blong crocus giant clam hemi haed fulwan insaed long korel o ston go kasem ej blong sel blong hem.

Oi natalae oli stap dring solwota we i pas tru long ol hol (luk long pilja blong hem) mo sem taem sefem aot ol smol plant we oli float insaed long wota ia we i kakae blong olgeta. Olgeta oli save karem kakae tu long ol smolsmol plant (*zooxanthellae*) we oli laef insaed long mit blong natalae. From ol smolsmol plant ia oli nidim laet blong san, ol bigfala natalae oli save laef mo gru nomo insaed long solwota we i klia mo salo.





#10

# Natalae Giant Clams (Tridacnidae)

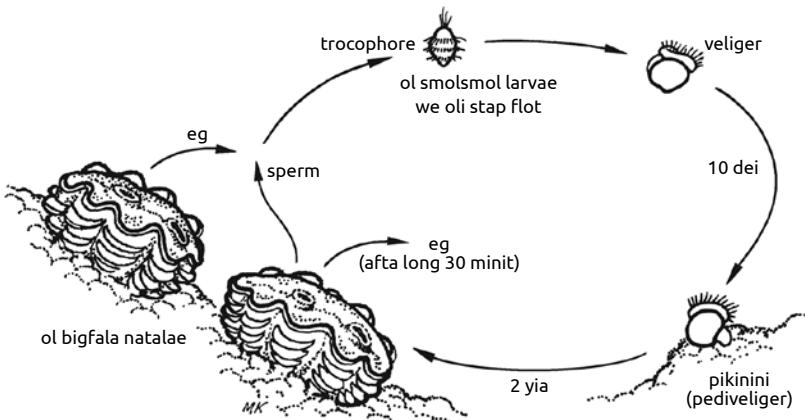


## Riprodaksen mo laef saekol

Ol bigfala natalae oli statem laef blong olgeta olsem ol man mo oli gruap finis taem oli gat 2 yia; afta long taem ia oli gat ol riprodaktif pat long bodi blong olgeta blong man mo woman sem taem, blong mekem pikinini.

Spawning hemi tekem ples long ol manis we i hot lelebet; taem ol natalae i save se i gat eg long solwota raon long olgeta, oli kapsaetem sperm tru long outlet opening (luk long pikja). Klosap 30 minit afta oli letemaot sperm, wan natalae i putum aot eg blong hem, minim se hemi no save fetalaesem eg blong hem nomo wetem stret sperm blong hem.

Namba blong eg we wan natalae i putum aot hemi defren long ol defren spisis, mo ol bigfala natalae oli save prodiusim ol milian blong eg. Ol eg we i fetalae finis oli brok mo ol smolsmol larvae oli kam aot mo stap flet long solwota long 10 dei. Aot long evri taosen larvae we oli flet, anda long wan i save laef blong kam wan pikinini natalae we i go sidaon long bed blong solwota long ful laef blong hem. Mo aot long evri handred pikinini, anda long wan i save gru i kam bigwan we i save mekem pikinini.



## Ol kaen fasin blong manejmen we yu save jusum

Manejmen blong natalae hemi impoten tumas from plante spisis oli bin kasem tumas long olgeta mo olgeta i lus finis long plante eria long Pasifik.

Plante otoriti blong fiseriss oli bin putum wan minimam saes limit long saed blong loa wetem tingting blong alaoem ol natalae blong mekem pikinini wan o mo taem bifo oli karem olgeta. Saes limit blong ol defren spisis i stap long wan buk blong SPC ([www.spc.int](http://www.spc.int)), nem blong hem Size limits and other coastal fiserises regulations in the Pacific Islands region.

Sam long ol otoriti oli bin aplaem wan saes limit nomo long evri spisis (blong givim wan eksampol, 180 mm blong evri spisis blong natalae). Saes limit ia i save bigwan tumas long ol spisis we i smol, olsem elongate giant clam *Tridacna maxima*, we i save gru kasem 350 mm nomo, mo i save smol tumas blong ol spisis olsem smooth natalae, *Tridacna derasa*, we i save gru kasem 600 mm. Saes limit i save wok gudwan mo sapos oli putum stret limit long wanwan spisis.

Sam otoriti oli bin putum wan ban long fasin blong havestem ol natalae blong salem olgeta mo oli putum wan bag limit long ol natalae we oli kolektem blong olgeta nomo i kakae (maet 3 go kasem 10 natalae blong wan man long wan dei). Blong salem natalae long ol lokol hotel o pablik ples blong kakae sam long ol otoriti i putum wan ban o putum wan stret limit long namba we oli save salem. Ol nasonal otoriti i gat impoten wok blong mekem blong putum ban long ekspot blong natalae mo blong blokem fasin blong ol sip blong ovasi we oli stap kolektem ol natalae we i no folem loa.

Long Vanuatu, loa blong fiseris hemi no alau blong haves tem wael natalae blong expotem. Ikat faen sapos eni man l brekem loa ia:

- **Sapos wan individual peson, faen isave kasem VT200,000; or**
- **Sapo wan kampani, faen I save kasem VT1,000,000.**

Ol komiuniti i save sapotem ol rul we ol nasonal otoriti oli putum long ol fasin olsem:

- **putum wan ban long fasin blong yusum ol tul blong pulum win anda long wota olsem SCUBA, we i save provaadem sam proteksen long ol bigfala natalae we oli laef long dip solwota, we olgeta i prodiusim ol pikinini blong natalae we i save kam stap long ol eria we wota i salo;**
- **setemap tabu eria we oli no save tekem natalae long hem. Long ol tabu eria ia, i nid blong gat bigfala namba blong natalae insaed long wan smol eria, blong givim mo janis long ol sperm blong fetalaesem eg taem oli kam aot long ol natalae we i stap klosap. Afta we ol larvae i flet long solwota long 10 dei maet ol pikinini blong natalae i save kam stap long eria klosap we taed i save pulum olgeta mo long ples ia oli save gru mo long fiuja oli rere blong ol fisa i kolektem olgeta.**

## Ol fasin blong kasem natalae

Oli save karem ol natalae long han taem solwota i drae. Oli save daeva from olgeta tu, be i tabu blong yusum ol tul blong pulum win anda long wota olsem SCUBA.



Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmmanetwork.org](http://www.lmmanetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker



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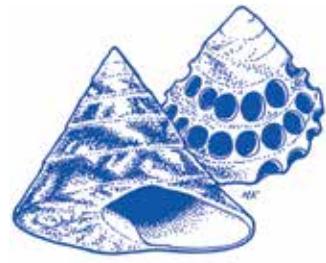


# 11

# Troka

## Trochus

(*Tectus niloticus*)



**Troka**  
Trochus  
(*Tectus niloticus*)



### Spisis mo distribiusen

Men spisis we oli gat intres long hem long ol aelan long Pasifik hemi *Tectus niloticus* (ex *Trochus niloticus*), hemi wan spisis we i big mo (we flat saed blong sel blong hem i 150 mm) mo sel i waet wetem ol laen we i red, mo insaed long hem i gat tik sel olsem pearl. Spisis ia oli kasem from mit blong hem mo from sel blong hem we oli mekem ol baten wetem. (Pikja antap i soem tu sel, wan we oli drilim blong mekem baten.)

Ples we yu save faenem ol troka hemi stat long Indian Osen igo long Pasifik Osen i kasem Fiji long is. Be oli bin karem spisis ia i go long sam kaontri we i stap long is blong Fiji, olsem long 1957 oli bin tekem olgeta aot long Fiji i go long Cook Islands.



### Ples we troka i stap long hem mo kakae blong hem

Pikinini troka oli stap laef long ol salo eria long medel blong ol bigfala mo ol smolsmol ston long ol rif flat we wota i kavremap olgeta evri taem. Long ol rif blong ol atol, ol bigfala troka yu faenem olgeta long top blong rif be long ol hae aelan yu faenem olgeta long ol slop blong rif go kasem ples we wota i dip olsem 20m. Troka oli kakae ol smolsmol plant we oli stap long korel wetem ston.





#11

# Troka *(Tectus niloticus)*

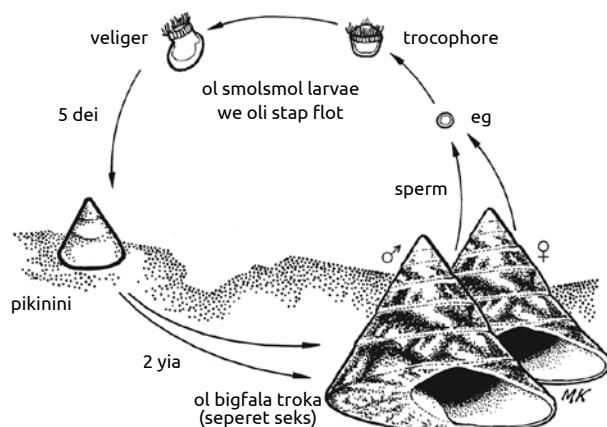


## Riprodaksen mo saekol blong laef

Troka i gat seperet seks, minim se i gat man troka mo woman troka. Ol troka oli save mekem pikinini afta long 2 yia taem we flat saed blong hem i 50 kasem 70 mm. Olgeta oli save laef kasem 15 yia.

Spawning i go hed tru aot long yia long ol ples we i mo hot oltaem mo long ol manis we i hot lelebet long ol kolkol eria. Olgeta oli save mekem ol grup blong spawn long naet long wan o tu dei bifo o afta fulmun o niuumun.

Long taem blong mekem pikinini, ol woman troka (♀) oli givim aot bitim long wan (1) milian eg we i fetalaes wetem sperm we man troka (♂) i kapsaetem. Ol eg we oli fetalaes oli brok mo putumaot ol smolsmol larvae we i flot wetem taed long solwota go kasem 5 dei bifo oli go stap long wan ston. Aot long evri taosen smolsmol larvae, anda long wan i save stap laef blong kam wan pikinini troka. Mo, aot long evri hundreded pikinini troka, anda long wan i save laef long 2 o bitim long 2 yia blong kam wan bigfala troka we i rere blong mekem pikinini.



## Ol kaen fasin blong manejmen we yu save jusum

Long plante kaontri oli putum minimam mo maximam saes limit. Minimam saes limit i alaoem wanwan troka blong spawn wan taem o mo bifo oli save pikimap olgeta. Ol maximam saes limit i gud from i soem se ol woman troka we i mo big oli karem mo eg be ol sel blong ol olfala troka ol wom oli stap kakae olgeta mo mekem valiu blong olgeta i go daon. Long Vanuatu limit i stap long 90 mm minimam mo 130 mm maximam long longfala blong flat saed blong olgeta.

Long Vanuatu, gavman i putum wan ban long yus blong ol tul blong pulum win anda long solwota blong karem troka. Long plante kaontri oli putum wan ban long fising blong troka blong long taem lelebet blong mekem populesen blong troka i kambak. Minimam saes blong populesen we i stret bifo fising i save stat bakegen hemi raon long 500 kasem 600 troka long wan hecta (10 000 m<sup>2</sup>).

Ol fasin blong manejmen we ol komiuniti i save mekem hemi dipen plante long saes blong populesen blong troka. Sapos namba blong troka i go daon, ol fasfala aksen we yufala sud tekem maet i inkludim:

- blong putum wan ban o tabu blong no tekem troka long eria blong fising. I gud sapos Vanuatu i putum wan tabu blong troka blong tri yia from i save alaoem taem blong troka i kambak plante mo blong ol bigfala troka oli save mekem pikinini.
- blong setemap wan marin resev we i stap oltaem long wan eria we i gat plante troka long hem (o ples we troka i save kam stap long hem). Hemia i save stap long ol aelan we i gat plante rif blong aloaem ol fisa blong gat akses long mit blong solwota. Bigfala tingting bihaen long hem i blong prodiusim ol yang troka we oli save sidaon long ol rif klosap long eria ia.

Tufala aksen ia ol komiuniti i save mekem i kam gud mo sapos oli muvum o introdiusim ol bigfala troka long ol nara rif we oli no bin tekemaot tumas finis long hem.

Sapos ol troka we i stap naoia oli helti, o taem namba blong troka i go antap bakegen, komiuniti i save sapotem ol rul blong gavman o ademap long olgeta tru long ol fasin olsem:

- setemap wan rotesonal fasin blong tekem troka, we fising eria blong komiuniti i divaied i go long ol smolsmol eria mo fising i tekem ples long wan eria long wanwan yia. Sapos i gat fo smol eria, wanwan long ol tri smol eria ia i save gat proteksen long tri yia blong i no gat fising.
- setemap wan komiuniti quota (wan bag limit blong wan yia) blong wan eria o rijen. Ol ofisa blong fiseriss mo risos monita oli save assistim komiuniti blong mekem wan sevei blong esti-metem namba blong ol saes blong troka folem loa blong saes long wanwan eria bifo fising i stat. Maximam namba blong troka we oli alao blong tekem i save stap long 30 kasem 40 pesen blong namba blong ol troka (folem loa blong saes) we oli stap long eria ia.



Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmannetwork.org](http://www.lmannetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker



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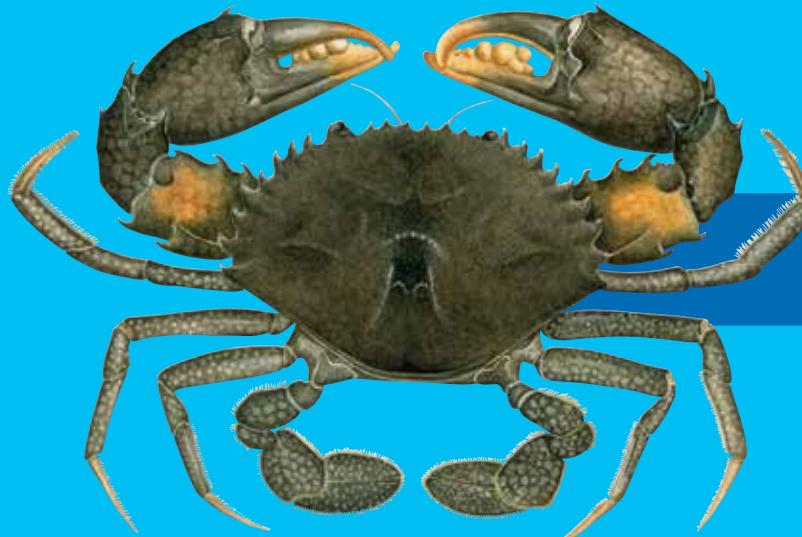
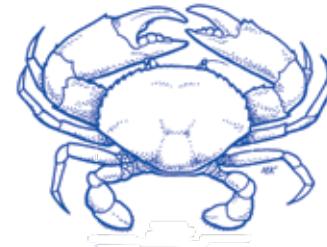
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# 12

# Krab kaltoni

## Mangrove Crab (*Scylla serrata*)



**Krab kaltoni**  
Mangrove Crab  
(*Scylla serrata*)



### Spisis mo distribiusen

Ol krab kaltoni, *Scylla serrata*, oli stap long ol rif blong tropik mo sab-tropik eria stat long Afrika kasem ol aelan blong Pasifik. Kala blong sel blong olgeta oli defren, sam long olgeta oli gat ol dak grin spot mo ol narawan olgeta i dak braon o pepol. Ol nara spisis blong krab kaltoni (*Scylla*) oli save stap nomo long sam eria.

Blong save difrens bitwin man mo woman krab, tanem krab mo lukluk sep blong flap (abdomen) long bel blong krab; sapos flap ia hemi sap long en blong hem, hemi wan man krab, be sapos hemi no sap long en blong hem be i waed, hemia hemi woman krab (luk long pikja blong hem).



### Ples we krab i stap long hem mo kakae blong hem

Ol krab kaltoni oli stap long ol eria blong sofmad we i stap klosap long ol natongtong mo bed blong si gras long ol maot blong riva we taed i stap kam antap mo long ol haba we wota i no muvmuv tumas. Ol kaen krab ia oli save digim sofmad mo haed long hem mo oli save stap long smol eria nomo (hemia long eria we oli muv ova long hem blong faenem kakae).

Krab kaltoni i stap kakae ol smolsmol natalae, ol wom, ol smol naora, ol smol fis, ol pat blong ol tri o plant, mo ol nara krab. Olgeta tu oli kakae ol nara krab kaltoni we oli smol mo o oli gat kil o oli no strong. Ol pijin blong solwota mo plante kaen fis oli kakae ol pikinini blong krab kaltoni. Oli faenem ol bigfala krab kaltoni long bel blong ol sak mo ol nara bigfala fis.





#12

# Krab Kaltoni Mangrove Crab (*Scylla serrata*)



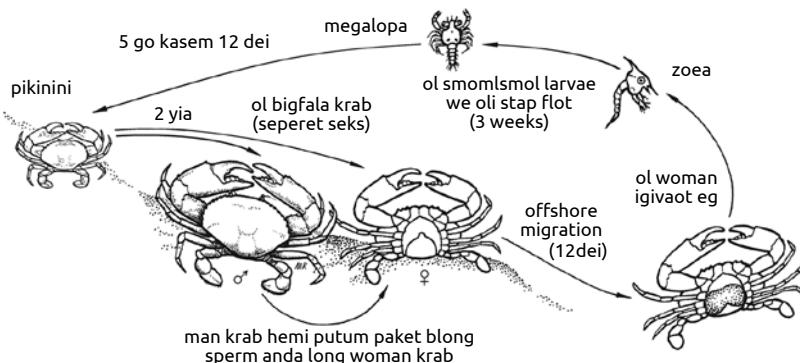
## Riprodakseen mo saekol blong laef

Ol krab kaltoni oli save kasem taem mekem pikinini taem oli kat 2 yia mo oli save laef long 3 kasem 4 yia hemia long taem we wet blong olgeta hemi save kasem 3.5 kg mo waed blong sel hemi kasem 24 cm.

Long taem blong mekem pikinini, ol man krab (♂) oli putum ol paket blong sperm (spermatophores) i go long andanit blong wan woman krab (♀) we sel blong hem i sof, mo long ples ia ol sperm i stap long plante manis. Ol woman krab oli givim aot ova long wan milian eg we sperm we oli bin kipim anda long olgeta i fetalaesem olgeta. Ol woman (naoia oli kolem olgeta berried) oli karem ol eg ia long 12 dei. Long taem ia kala blong ol eg i jenis aot long orenj i go klosap blak, taem ol krab i stap gru insaed long olgeta.

Ol woman krab oli muv i go aotsaed long so mo oli putumaot ol eg, mo ol eg ia oli brok mo aot long olgeta i kam ol smolsmol larvae we long taem ia nao oli 1 mm long. Oli flot long solwota blong 3 wik mo oli folem taed i gobak long ol eria long so.

Long en blong taem ia ol smolsmol larvae oli go stap long botom blong solwota mo oli gru i kam ol pikinini blong krab (aboot 4 mm waed) hemia bitwin 5 mo 12 dei. Aot long evri taosen blong ol smolsmol larvae, anda long wan i stap laef blong kam wan pikinini blong krab. Mo aot long evri hundred pikinini, anda long wan i save laef mo kam wan bigfala krab.



## Ol kaen fasin blong manejmen we yu save jusum

Long plante kaontri oli bin putum ol rul long ol krab kaledoni, espeseli long ol ples we oli gat valiu long maket. Long Vanuatu i no gat ol rul we i kontrolem ol krab ia from maket blong hem i smol tumas.

Ol fasin we i save help blong manejem ol krab kaltoni i inkludim quota o catch limit (namba blong krab long wan dei), wan limit long namba blong ol trap mo limit long namba blong laesens blong salem krab. Ol rul ia i no aplae i go long ol fiseriss we i komuniti bes.

Ol fasin we i save aplae long fising blong krab kaltoni hemi inkludim aplikesen blong minimam saes limit (olsem waed blong sel i mas bitwin 120mm mo 150mm), stopem blong karem woman krab, stopem blong karem krab we i gat eg, mo stopem blong yusum sam fasin blong fising olsem gill net mo spia. Trap hemi wan gudfala wei blong kasem krab kaledoni from i no damejem bodi blong krab, we i minim se oli save letem krab i go bak long solwota sapos i wan woman krab o i smol tumas o i gat eg.

Long sam kaontri oli no alao blong karem krab kaltoni long taem blong riprodakseen. Blong aplaem mesa ia i nid blong gat save long taem blong spawning long wan eria.

Tabu eria we i stap oltaem i no save mekem local popule-sen blong krab kaledoni i go antap from ol woman krab oli stap muv wan long distens aotsaed blong spawn. Mo tu from se ol smolsmol larvae oli flot long solwota blong sam wik we i minim se ol pikinini blong krab maet oli setel long ol eria we long wei aot long tabu eria o fising graon.

Ol fasin we maet i gud blong wan fising komuniti i kom-baenem blong mekem se namba blong kaen krab ia hemi sastenebol i blong:

- putum wan ban blong oli no tekem ol woman krab o, sapos hemia i no pisibil, blong no tekem olgeta we oli gat eg;
- putum wan ban blong no tekem eni krab we i smol bitim wan nasonal minimam saes (o sapos i no gat minimam saes, anda long 140 mm we i waed blong sel blong hem)
- protektem ol lokol eria blong natongtong mo bed blong si gras from oli ol impoten ples blong krab kaltoni i stap long hem



## Fasin blong kasem ol krab kaltoni

Ol krab kaltoni oli kasem long fasin olsem:

- oli kolektem wetem han nomo, mo samtaem wetem stik we i gat huk long hem blong karem krab aot long hol;
- oli yusum spia long naet wetem wan toslaet;
- oli yusum ol scoop-net we i gat longfala handel long ol bed blong si gras;
- oli yusum gill net we oli setemap klosap long ol natongtong blong kasem ol krab kaltoni taem oli muv igo long dip solwota;
- oli yusum ol bet trap mo haos trap we oli mekem long string o net waea.



Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmannetwork.org](http://www.lmannetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker



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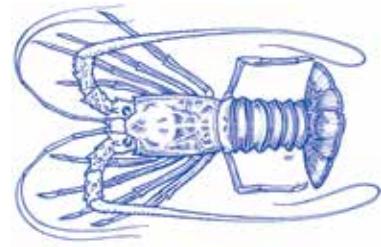
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# 13

# Naora blong solwota

Spiny lobster  
(Palinuridae)



**Straep leg naura**  
Stripe-leg spiny lobster  
(*Panulirus longipes spinosus*)



**Blu hon naura**  
Pronghorn spiny lobster  
(*Panulirus penicillatus*)



**Kala spaeni naura**  
Painted spiny lobster  
(*Panulirus versicolor*)



## Spisis mo distribiusen

Spiny lobster o naora blong solwota i no olsem ol tru naora we oli gat ol bigfala han. Oli stap nomo long ol solwota we i hot smol. Ol spisis we i intres blong olgeta long ol aelan blong Pasifik hemi ol naora we oli blong genus grup ia *Panulirus*.

I kat sikis spisis long Solomon Aelan, be wan nomo aot long olgeta, we oli kolem pronghorn spiny lobster, *Panulirus penicillatus*, oli stap kasem long ol aelan blong is blong Polynesia. Long Papua New Guinea, oli kasem ornate lobster, *Panulirus ornata*; be men spisis we oli stap kasem long Pasifik hemi pronghorn spiny lobster wetem smol namba blong stripe-leg spiny lobster, *Panulirus longipes spinosus*. Long Vanuatu i gat fo difren kaen naora, i gat pronghorn spiny lobster (*Panulirus penicillatus*), stripe-leg spiny lobster (*Panulirus longipes spinosus*), mo painted spiny lobster (*Panulirus versicolor*). Komon spisis we i stap tru aot long ol maket blong Vanuatu hemi spiny lobster *Panulirus penicillatus*. Long ol nara aelan blong Pasifik painted spiny lobster (*Panulirus versicolor*) hemi no impoten tumas.



## Ples we naora i stap long hem mo kakae blong hem

*Naora blong solwota oli stap laef insaed long ol hol blong rif mo oli stap muv aot long naet blong kakae.*

Ol pronghorn spiny lobster oli stap laef long ples we solwota i stap brok mo oli muv i go long ol rif flat blong faenem kakae. Ol stripe-leg lobster oli stap laef long ol dip wota mo painted spiny lobster oli stap laef long ol ples blong korel mo tu long ol dip wota aotsaed long ol rif slop. Ol ornate lobster oli faenem long ol salo lagun go kasem lagun rif we i lid i go long aotsaed.

Ol naora oli kakae ol si snel, natalae, krab, si-kukamba, ol plant blong rif (korelaen nalumlum) mo ol ded animol. Be ol bigfala fis, olsem sak mo ol nawita oli stap kakae ol naora.





#13

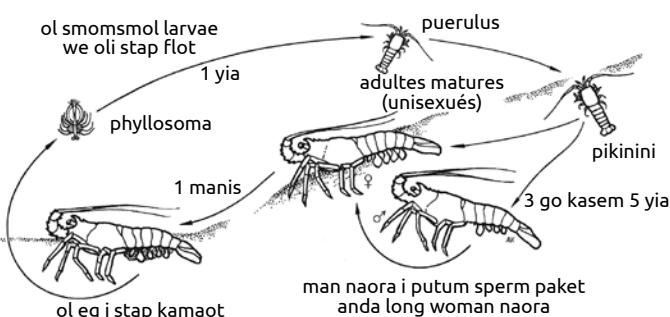
# Naora blong solwota Spiny lobster (Palinuridae)



## Riprodaksen mo saekol blong laef

Ol defren spisis blong ol naora blong Pasifik laef saekol blong olgeta i klosap sem mak nomo. Olgeta oli gat seperet seks, minim se i gat woman naora mo man naora, mo, from i dipen long spisis mo ples we hemi stap, oli save kasem saes blong mekem pikinini taem oli kasem 80 mm, hemia i longfala blong sel blong hed blong hem. Ol naora oli save kam bigwan finis long 3 go kasem 5 yia mo oli save laef kasem 10 yia.

Plante spisis oli mekem pikinini truaot long yia, mo samtaem ol aktiviti blong mekem pikinini i save go antap long ol manis we i hot mo long wan yia. Wan man naora (♂) i putum paket blong sperm (spermatophore) i go long andanit blong woman naora (♀). Ol woman oli rilisim plante taosen eg we oli fetalaes taem oli pas ova long sperm packet ia. Ol eg we oli fetalaes oli stap long woman naora blong wan manis bifo oli brok mo ol smolmol larvae oli kam aot. Oli flot long solwota blong wan yia o mo. Aot long evri taosen blong ol smolmol larvae, anda long wan i save laef blong stap long botom blong solwota olsem wan pikinini naora. Mo, aot long evri 100 pikinini naora, anda long wan i save kam wan bigfala naora we i save mekem pikinini.



## Ol kaen fasin blong manejmen we yu save jusum

Long Vanuatu minimam saes blong naora we i stap anda long rul blong fiseriss hemi 22 sentimita, stat klosap long tufala hon blong hem kasem en blong tel blong hem. I gud tumas blong gat ol nasonal saes limit sapos oli save jekem ol naora we oli kasem long fiu maket ples nomo.

Regiulesen blong fiseriss blong Vanuatu hemi no alaoem ol fisa blong tekem, givim kil, karem wetem hem o salem eni naora we i gat eg o blong pem naora we oli karem eg blong hem, o ekspotem naora o krab we daerekta blong fiseriss i no otoraesen. Ol faen blong brekem ol loa ia hemi 1,000,000 VT long wan kampani mo 200,000 VT long wanwan man.

Manejmen blong naora long ol komiuniti hemi blong putum tabu long haves blong naora. Be blong mekem populesen blong naora i kam antap plante i nid blong plante komuniti long wan aelan oli setemap ol tabu eria. Hemia i from ol smolmol larvae blong naora i save flot longtaem (samtaem ova long wan yia) long solwota bifo oli save setel long wan rif. I minim se maet ol pikinini blong ol naora blong wan rif i no save kambak blong stap long rif we mama blong hem i stap long hem mo oli go setel long wan nara rif.

Sapos wan atol o wan komiuniti blong wan smol aelan i tekem aksen blong manejem fiseriss blong naora blong hem, i mas gat benefit long ol lokol fisa. Be sapos wan nomo aot long ol komiuniti long wan long-fala kos i tekem ol manejmen aksen, ol namba blong ol naora i save go daon yet, sapos namba blong ol naora blong ol nara komiuniti we oli stap klosap i bin go daon. Long situesen olsem, i gud tumas sapos plante lokol komiuniti i save wok wamples mo agri long ol sem mak fasin blong manejmen.

Blong sapotem ol nasonal fasin blong manejmen, ol komiuniti i save mekem olsem:

- Putum wan limit long hamas kilo komiuniti i save havestem. Wan gudfala limit hemi 20 kg blong naora long wan kilomita blong rif blong wan yia.
- No karem naora long wan rif nomo evri taem, go long ol nara rif blong karem naora tu blong mekem se namba blong naora long ol rif ia i no go daon tumas, olsem rotetem haves blong naora long ol olgeta difren rif.
- putum wan ban blong no tekem ol smol naora we i no folem loa blong fiseris (olsem enfosem fisaris regiulesen blong minimam saes limit);
- Stopem yus blong ekwipmen blong pulum win blong daeva anda long solwota;
- topem yus blong spia. Sapos oli karem naora wetem han nomo hemi minim se oli no tekem ol smol naora, from ol laef naora i gat mo valiu bitim ol ded wan.
- blokem olgeta blong no tekem ol woman naora we oli karem eg.



## Fasin blong kasem naora

Long plante aelan long Pasifik, men fasin blong fising we oli stap yusum hemi blong kolektem naora wetem han o blong daeva fri long naet wetem toslet.

Sam naora oli tekem wetem spia, mo, sori blong talem, samtaem oli yusum ol tul blong pulum win anda long solwota olsem SCUBA.

Plante bigfala operesen blong kasem naora long ol aelan blong Pasifik oli no wokaot gud from ol men spisis oli stap long wan lo kwantiti long wanwan ples mo olgeta oli no stap laekem blong kam insaed long ol trap o pot (wan eksepsen hemi spiny lobster blong Hawaii). Hemi impoten tumas blong kipim ol fising blong naora i stap nomo blong ol lokol pipol we oli save salem long ol lokol maket.



Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmannetwork.org](http://www.lmannetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker



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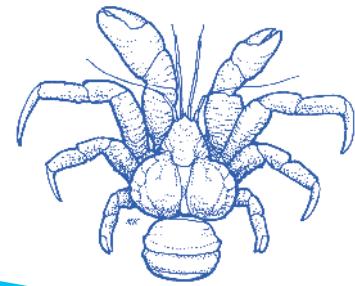
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# 14

# Krab kokonas

## Coconut crab (*Birgus Latro*)



**Krab kokonas**  
Coconut crab  
(*Birgus latro*)



### Ples we krab i stap long hem mo kakae blong hem

Ol bigfala krab kokonas oli stap laef olgeta wanwan nomo long ol hol andanit long graon o long hol blong ol ston long ol fores we oli stap klosap long solwota. I gat sam krab kokonas oli faenem sikis kilomita aot long solwota. Ol bigfala krab oli no save swim mo oli save draon sapos oli go insaed long dip solwota.

Ol krab kokonas oli stap haed tru long dei mo oli kamaot long naet blong lukaotem kakae. Oli stap kakae ol nara kaen krab, ol ded animol, mo samtaem oli save go luk long ol tin doti blong faenem haf kakae blong yumi ol man we i stap. Olgeta oli kakae tu ol lif we i roten mo frut blong Pandanus mo frut blong kokonas we oli foldaon long graon. Olgeta oli save karemaot skin blong kokonas wetem bigfala klo blong olgeta mo brekem ae blong kokonas wetem leg blong olgeta.



### Spisis mo distribiusen

**Krab kokonas, Birgus latro, hemi wan long ol crustacean (ol animol we oli gat wan had kava long bak blong olgeta) we hemi famli blong nakato.**

Ol pikinini blong hem oli laef insaed long ol sel blong si snel (gastropod) be ol bigfala wan oli no stap insaed long wan sel mo oli gru blong kam bigwan long graon. Krab kokonas hemi big bitim ol nara krab mo hemi save gru kasem wan wet blong ova long 4 kg (mo i gat sam ripot blong wet we i kasem 14 kg). Ol bigfala krab kokonas oli gat ol bigfala klo wetem tut mo longfala leg, we i helpem hem blong save klaem long ol tri. Kala blong evri bigfala krab kokonas i no sem mak. Sam oli laet pepol, sam oli dip pepol mo sam oli braon.

Ol krab kokonas oli stap long ol tropikol aelan stat long Indian Osen go kasem French Polynesia long Pasifik Osen. Hemi wan krab we i muv slo nomo. From we ol dog mo pig i save atakem mo kilim hem mo ol ples we oli stap long hem long kos oli klinim olgeta, i minim se kaen rab ia i lus long plante aelan mo atol long Pasifik.

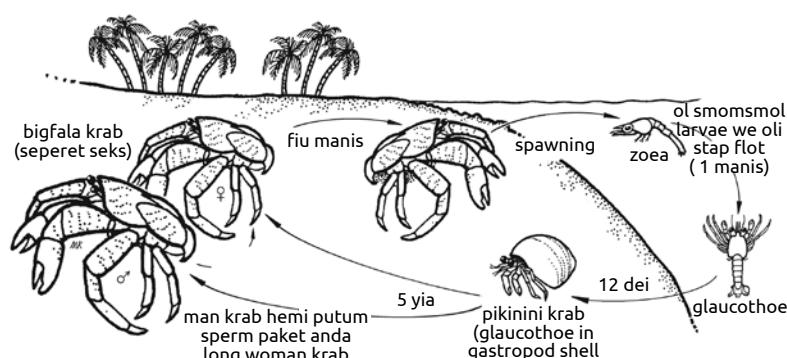


### Riprodaksen mo saekol blong laef

Ol krab kokonas oli gat seperet seks. Long Vanuatu krab kokonas i mekem eg long manis blong Oktoba mo Maj long evri yia. Long taem we man mo woman krab i kam tugeta, man krab ( $\sigma$ ) i putum paket blong sperm blong hem i go long andanit long bel blong woman krab ( $\varphi$ ) we sel blong hem i sofsof. Afta we sam wil i pas, woman krab hemi givimaot eg blong hem. Ol eg ia i fetalaes taem oli pas ova long paket blong sperm (spermatophore) mo oli stap stak tugeta olsem wan big orenj spons, we woman krab hemi stap karem andanit long bodi blong hem long samfala manis.

Ol woman krab kokonas oli muv i godaon long solwota mo rilism ol eg we oli fetalaes igo long solwota long taem blong hae taed. Ol eg ia oli brok mo ol smosmol larvae oli kamaot mo flot long solwota blong wan manis. Aot long wan taosen larvae, anda long wan i save laef blong go long so mo go insaed long wan sel blong si-snel we i stret long hem. Taem oli stap jenis i kam pikinini krab, bodi blong olgeta i kam strong mo oli lusum ol sel ia we i bin protektem olgeta mo muv i go mo long graon taem oli stap gru blong kam ol bigfala krab kokonas. Aot long evri hundred pikinini krab, anda long wan i save laef blong kam wan bigfala krab kokonas.

Sem mak long evri crustacean, krab kokonas i jenisim sel blong hem (had aotsaed blong hem) long samfala taem nomo blong letem hem i save gru. Taem oli jenisim sel, i tekem 30 dei blong niu sel i gru mo kam strong, mo from se hemi no strong long taem ia hemi mas haed blong protektem hem wan blong save stap laef. Krab kokonas oli save mekem pikinini taem oli gat 5 yia mo oli save laef kasem ova long 30 yia.





#14

# Krab kokonas Coconut crab (*Birgus Latro*)



## Fasin blong kasem krab kokonas

Ol krab kokonas ol pipol oli laekem tumas blong kakae olgeta, mo, from oli si tumas blong kasem olgeta, populesen i kam daon plante long ol aelan. Ol lokol pipol oli save putum bet blong kokonas we oli openem mo fasem igo long graon long naet mo oli go jekem ol bet long naet wetem toslaet. Nomata we farming hemi wan wei we oli ting se oli save prodiusim krab kokonas blong salem long maket, saekol blong laef blong olgeta hemi compliketed mo oli gru slo tumas mekem se i had tumas blong wokem.



## Ol kaen fasin blong manejmen we yu save jusum

Long Vanuatu, gavman i manejem krab kokonas folem wan krab kokonas manejmen plan. Folet plan ia i gat tu provins mo tu aelan nomo we loa blong fiseris i regiuletem. Tufala provins ia i gat provins blong Torba mo provins blong Sanma mo tufala aelan ia i gat aelan blong Maewo mo aelan blong Erromango. Manejmen mesa we gavman i yusum hemi quota sistem (haomas krab oli save tekem) long ol defren aelan mo provins, open sison, saes limit mo ol nara mesa. Long provins blong Torba quota blong wan yia we i stap hemi 5,000 krab nomo we oli save havestem. Long provins blong Sanma quota we i stap hemi 2,000 krab, long aelan long Maewo quota we oli alao blong karem hemi 1,500 mo long aelan blong Erromango hem 2,000 krab. Insaed long ol provins ia mo ol aelan ia ol quota oli divaed igo long ol men eria we i bin gat gud histri blong havest long hem. Saes limit we gavman i putum long krab kokonas hemi 9 sentimita, hemia we oli meserem stat long en blong hed klosap long tufala hon ia go kasem en blong sel blong baksad blong krab.

Eria	Sisen we i klos
Provins blong Torba	30 okis – 1 novembra long evri yia
Provins blong Sanma	1 Mei 2004 – 31 Maj 2012
Aelan blong Maewo	1 novembra – 30 eprel long evri yia
Aelan blong Erromango	1 septembra – 31 maj long evri yia

Provins blong Torba	
Saet	Quota
<b>Torres</b>	
Hiu	1,500
Tegua	1,500
Loh	500
Toga/Metoma	200
<b>Banks</b>	
Mota Lava	400
Gaua	400
Other	500
Total	5,000

Provins blong Sanma	
Saet	Quota
North Santo (Port Olry/ Cape Quieros/Loran)	700
Hog Harbour	350
Kole	150
Shark Bay/Mavea	200
Saot Santo	300
Malo/Aore	300
Total	2,000

Provins blong Penama	
Aelan blong Maewo	
Saet	Quota
Naone viley	500
Marino viley	500
Naumumu Viley	500
Total	1,500

Provins blong Tafea	
Saet	Quota
Aelan blong Erromango	2,000
Total	2,000

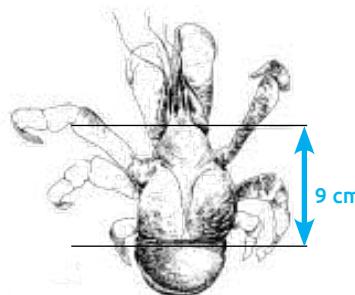
Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmannetwork.org](http://www.lmannetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker

Ol narafala rul long Vanuatu blong manejem krab kokonas hemi se man o woman i no alao blong tekem, givim kil, karem wetem hem, salem o pem, eni krab kokonas we i stap karem eg o eni krab kokonas we i woman we i gat eg o we oli stap karem aot eg blong hem i no alao blong eni man o woman blong havestem, prosesem mo salem. Hemi tabu tumas blong karemaot eg blong wan woman krab kokonas mo i no alao blong ekspotem krab kokonas sapos daerekta blong fiseris i no otoraesem.

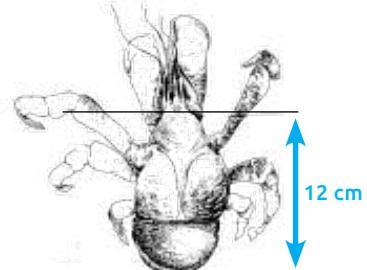
Ol faen blong brekem rul blong wan koporet bodi, asosie-sen o kampani i VT1,000,000 maximam, mo blong wan man i VT200,000 maximam.

Long Vanuatu nasonal minimam saes limit blong kokonas krab hemi 9 cm, bea Torba Province noma hemi inkrisim saes limit blong kokonas krab I ko long 12 cm. Hemia I folet disisen we minister I signem long 2015.

Nasonal Minimam Legal Saes blong Kokonas Krab



Minimam Legal Saes blong Kokonas Krab blong TORBA PROVINCE



Ol nasonal regiulesen oli wok gudwan sapos oli save jekem ol krab kokonas long fiu maket ples nomo. Be sapos oli mekem fising long naet mo oli save salem ol krab tru long ol lokol maket, hotel mo publik ples blong kakae olbaot, i had tumas blong enfosem ol regiulesen ia.

Blong putum wan ban blong ol pipol i no kasem ol krab kokonas long taem blong putum eg i no save wokaot from ol woman krab oli karem ol eg blong olgeta ova wan long taem.

Long sam kaontri oli mekem se i agensem loa blong salem ol krab kokonas long ol restaurant (ples blong kakae). Hemia i wan gud tingting be i minim se ol lokol pipol oli no save winim mane long fasin ia. Be ol komiuniti i save mekem mani long wan nara wei wetem ol krab kokonas tru long eco-tourism.

Komiuniti aksen maet i inkludim:

- setemap wan resev blong ol krab kokonas long wan eria we i gat gudfala ples blong oli stap laef mo haed long hem. Hemia mas gat fanis blong blokem ol animol blong no go insaed mo hemi mas gat akses long solwota blong alaoem ol krab blong riprodus. Fastaem, taem oli rere blong openem wan resev, maet i gat nid blong tekem sam krab aot long ol ples klosap blong kam insaed long resev;
- alaoem ol turis we i pem wan fi blong go long wan tua long naet wetem gaed blong luk ol krab long ples we oli stap long hem. Ol nasonal oganaesen blong turis mo ol hotel maet oli save help blong atraktem ol turis;
- mekem sua se ol komiuniti i folet ol nasonal loa mo regiulesen long saed blong ol krab kokonas.



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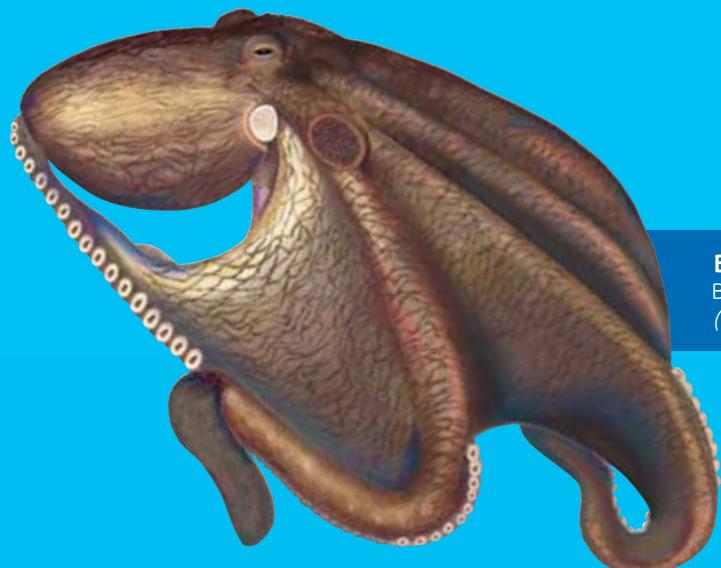
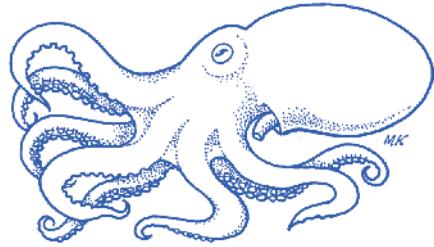
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# 15

# Nawita Octopus (Octopus)



**Bik blu nawita**  
Big blue octopus  
(*Octopus cyanea*)



## Spisis mo distribiusen

Nawita ol famli blong hem i inkludim ol squid mo natalae mo oli gat 8 han we i gat ol saka anda long olgeta we i save stak long rif blong helpem olgeta blong muv. Hemi gat wan sofsof bodi olsem bag, mo ol strong jo we i olsem maot blong pijin. I kat klosap 100 spisis blong nawita we i stap long solwota raon long wol.

Nomata we nawita oli stap laef long botom blong solwota, olgeta oli save swim kwik taem taem oli pusum aot wota tru long ol spesol fanel we i stap long bodi blong olgeta. Olgeta oli save jenisim kala mo kivim aot wan black ink we i save helpem hem blong ronwei long ol nara animol we oli traem blong kasem hem. Evri nawita oli save baet wetem strong jo blong hem, be wan grup blong nawita we hemi blue-ring nawita hem denjares tumas long yumi ol man from i save kilim yumi i ded.

I kat defren kaen saes blong nawita be common reef o day octopus, *Octopus cyanea*, we hemi stap long plante rif long Pasifik, i save gru kasem wan mita.



## Ples we nawita i stap long hem mo kakae blong hem

Ol nawita blong rif oli stap laef andanit long rif mo long ol hol blong hem. Yu save luk save olgeta hol blong nawita from ol smolsmol ston mo pis kakae blong olgeta, we i inkludim ol emti sel, we i stap klosap long hol ia.

Plante blong olgeta oli kakae long naet, be i gat sam olsem common reef octopus we oli kakae long dei. Olgeta oli stap kakae ol smol natalae, ol krab, ol smol naora, ol naora, ol wom mo sam kaen fis. Ol namarae, ol sak, ol stingre mo sam bifala fis oli stap kakae olgeta nawita.





#15

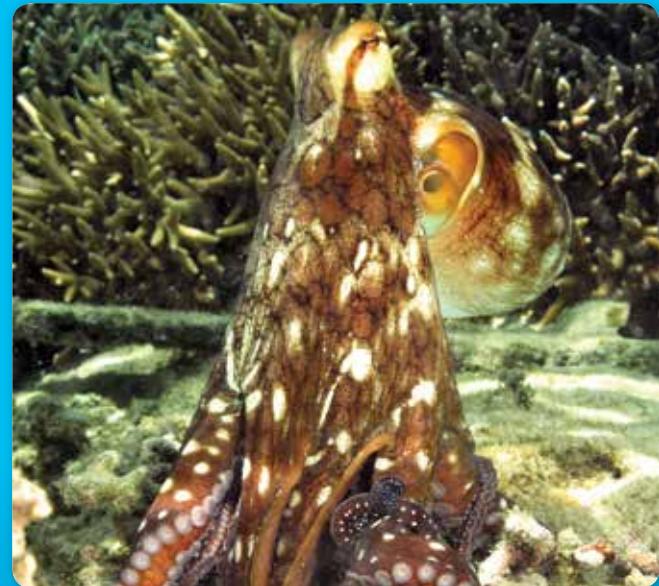
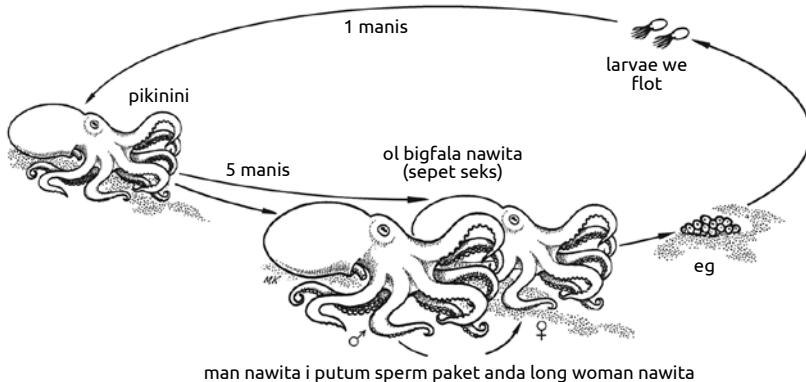
# Nawita Octopus (Octopus)



## Riprodakson mo saekol blong laef

Ol nawita oli kat ol seperet seks, minim se i gat man wetem woman nawita. Long taem blong mekem pikinini, man nawita i yusum wan han blong hem blong putum paket blong sperm andanit long bodi (mantle) blong woman nawita. Woman nawita i givimaot plante handred eg we oli fetalaes wetem ol sperm we oli bin stap andanit long bodi blong hem.

Woman nawita i putum ol eg we oli stap tugeta andanit long ol ston o insaed long hol o nest long ston long rif. Hemi protektem ol eg mo hemi no save go blong lukaotem kakae blong sam wik kasem taem ol eg i brok. Taem we i brok ol niu smolsmol larvae i kamaot we i luk olsem ol smol nawita mo oli stap swim long solwota blong wan manis. I kat sam nomo, maet wan aot long wan handred, we oli save laef mo setel long botom blong solwota olsem ol pikinini nawita. Nawita i save gru blong kam bigwan inaf blong mekem eg long anda long faev manis mo oli save laef blong 1 o 2 yia nomo.



## Ol fasin blong manejmen we yumi i save jusum

I no kat plante rul long saed long fiseris we i bin aplae long ol nawita no mata we namba blong olgeta i go daon long plante rif.

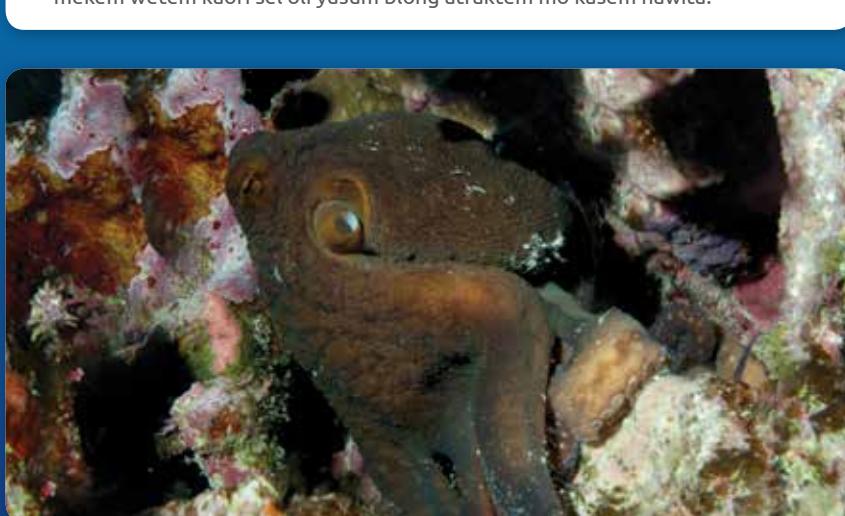
Ol minimam saes limit, we papos blong olgeta hemi blong alaoem ol nawita blong mekem pikinini long wan o mo taem bifo oli kasem olgeta oli no yusful tumas long ol fiseris blong nawita. Plante long ol fasin blong fising oli damejem ol nawita mo olgeta yangfala we oli rilisim olgeta afta we oli bin kasem olgeta oli no gat tumas janis blong stap laef.

Ol posibol manejmen mesa we komiuniti i save tekem hemi inkludim putum wan ban long ol fasin blong fising we i save damejem ol korel.

Ol regiulesen we nasonal gavman i putum komiuniti i save sapotem olgeta o ademap long olgeta olsem:

→ setemap ol tabu eria mo blokem olgeta blong no kasem nawita insaed long ol eria ia. Long Fasin ia namba blong ol bigfala nawita we oli save mekem pikinini we i stap insaed long tabu eria i save go antap mo tu oli save putum mo nawita i go long ol ples we i klosap, espeseli ol ples we taed i stap flo igo daon long hem, we oli save kasem olgeta.

→ makem aot ol fising graon mo divaedem olgeta i go long ol smolsmol eria mo manejem olsem: long wan yia oli save havestem ol nawita long wan long ol smol eria nomo, mo oli no save fising from nawita long ol nara eria, mo long nekis yia oli save havestem long wan long ol nara smol eria. From nawita i gru hariap, populesen blong hem i save inkris long wan sot taem ova long 1 o 2 yia insaed long ol smol eria we fising i no alao, i go long taem we oli kasem saes we oli save mekem pikinini.



Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmmanetwork.org](http://www.lmmanetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker



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#16

# Grin snel

## Green snail/Turban shell (*Turbo marmoratus*)



**Grin snel**  
Green snail/Turban shell  
(*Turbo marmoratus*)



### Spisis mo distribiusen

Grin snel o Turban shell, *Turbo marmoratus*, hemi wan bigfala si snele we i save gru kasem 2 kg. Hemi gat sel we i hevi tumas mo wan bigfala lid we oli kolem operculum (we samtaem oli kolem "ae blong puskat") we i save blokem mit blong sel taem we wan animol i distebem o atakem snel ia. Grin snel oli karem from mit blong hem mo kala blong sel blong hem, we oli salem i go long ol faktri blong mekem baten, mo ol nekles mo tu maet blong katem long ol smol pis mo putum olgeta insaed long wan wud blong wan tebol o kros blong flasem hem.

Ol najoral ples we ol grin snel oli stap long hem i stat long Indian Osen tru long Saot-Is Esia mo go long Pasifik Osen kasem Vanuatu. Be oli bin tekem sam grin snel blong putum olgeta blong gru igo long is long Pasifik hemia long Tonga mo Franis Polynesia.



### Ples we grin sel i stap long hem mo kakae blong hem

Ol grin snel oli laekem blong stap long ples we solwota i brok mo long ol rif slop we korel i stap long hem. Ol pikinini grin snel oli stap haed long ol crak mo hol blong ston. Ol bigfala grin snel oli muv raon long naet blong kakae ol plant (red mo grin nalamblum blong solwota). I gat plante animol we oli kakae ol grin snel, olsem krab, mantis shrimp, nara kaen si-snel, nawita, ol bigfala fis mo ol nara snel.





#16

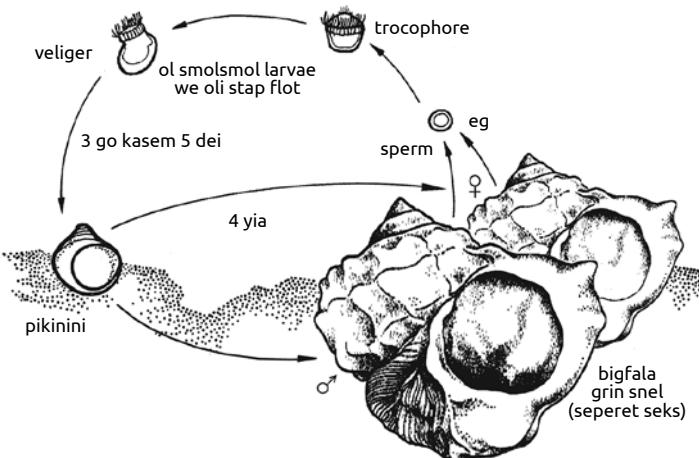
# Grin snel Green snail/Turban shell (*Turbo marmoratus*)



## Riprodaksen mo saekol blong laef

Grin snel oli gat seperet seks, minim se i gat man mo woman grin snel. Oli save mekem pikinini taem waed blong sel i 130 go kasem 150 mm, hemia abaot 4 yia olsem. Long ol ples we i kolkol smol, oli luk se grin snel i mekem pikinini long ol manis we ples i hot smol, be long ol ples we oli hot oltaem, oli save mekem ol pikinini truaot long yia.

Long taem blong riprodaksen, wanwan woman grin snel (♀) i letemaot plante milian eg i go long solwota, mo ol eg ia oli fetalaes wetem ol sperm we wanwan man grin snel (♂) hemi kapsaetem. No mata we ol eg i mo hevi bitim solwota, taed i save karem olgeta ova long ol longfala distens. Ol eg ia we i fetalaes oli putumaot ol smolsmol larvae we oli stap flos long solwota. Long evri taosen smolsmol larvae, anda long wan i save stap laef blong go setel long botom long solwota olsem wan pikinini we i gat sel, insaed long 3 kasem 5 dei. Aot long evri hundred pikinini, anda long wan i save laef blong kam wan bigfala grinsnel.



## Ol fasin blong manejmen we yumi i save jusum

Long Vanuatu, dipatmen blong fiseris i bin stopem ol man blong no tekem grin snel truaot long Vanuatu stat long 1 Oktoba 2005. Ban ia bae i finis long namba 1 oktoba 2020. Wetem ban ia ol man i no alao blong tekem, kilim, karem wetem hem, salem o pem eni grin snel long taem we klos sison ia i stap.

Plante long ol Pasifik kaontri oli yusum saes limit (plante taem bitwin 130 mo 150 mm akros long sel) blong manejmen fising blong grin snel, hemia blong alaoem grin snel blong save mekem pikinini fastaem bifo oli i save tekem olgeta.

Vanuatu fiseris i bin mekem wan regiulesen blong blokem ol fisa blong oli no yusum ol ekkipmen blong pulum win anda long solwota blong karem ol grin snel. Hemia i blong protektem ol grin snel we oli stap long ples we oli dip blong oli save mekem pikinini mo populetem bakegen ol rif eria we wota i salo.

Ol regiulesen ia oli gat smol yus nomo long plante eria we ol grin snel i bin go lus evriwan from fasin blong fising we i hevi tumas. Sam kaontri oli banem fising blong grin snel long wan taem blong go kasem 15 yia blong letem ol populesen i kam gud bakegen. From hae valiu blong ol grin snel, plante komiuniti oli faenem i had blong protektem olgeta agens long ol komesel fisa.

Ol fasin blong manejmen we ol komiuniti i save tekem i dipen long saes blong populesen blong grin snel we i stap long rif. Sipos i nomo gat plante grin snel ol posibol aksen blong tekem hemi:

- **blong putum mo enfosem wan ban blong no kolektem ol grin snel long ol rif blong komiuniti.** Tabu blong grin snel ia i mas stap long sam yia blong alaoem namba blong grin snel i go bak antap mo blong alaoem bigfala grin snel blong mekem pikinini.
- **blong setemap wan tabu eria we i stap oltaem long ples we i gat ol bigfala grin snel (o long wan ples we oli bin muvum sam grin snel i kamaot long wan nara ples).** Wetem sot taem we ol smolsmol larvae blong grin snel i save flos long solwota, maet i gat posibiliti se ol pikinini grin snel oli sav setel insaed long tabu eria mo long ol eria klosap we taed i flo igo long hem.

Sapos populesen blong grin snel hemi helti, o taem populesen blong grin snel i go antap bakegen, ol manejmen mesa ia ol save putum blong mekem se haves blong grin snel hem i sastenebol:

- **setemap rotesonal haves, hemia i minim se eria blong grin snel i mas divaed igo long ol smolsmol eria.** Sipos i gat faef (5) eria, long wan yia haves i mas stap nomo long wan long ol eria ia, minim se wanwan long ol eria ia i gat janis blong stap tabu long 4 yia we i save alaoem ol namba blong grin snel i go antap mo mekem pikinini.
- **setemap wan quota system long ol komiuniti (bag limit or hamas kilo blong karem).** Olgeta fiseris ofisa oli save helpem komiuniti blong karemaot sevei blong faenemaot hamas grin snel i stap long eria blong komiuniti. Quota we komiuniti i save havestem hemi save stap long 40 pesen blong populesen blong grin snel we i stap long eria blong komiuniti. Sipos i no gat wan nasional minimam saes, komiuniti i save aplaem minimam saes blong 140 mm, hemia i mesamen blong akros long sel.



Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmannetwork.org](http://www.lmannetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker - Aymeric Desurmont



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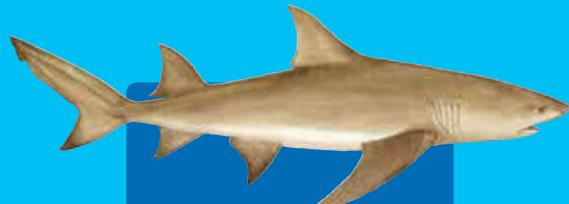
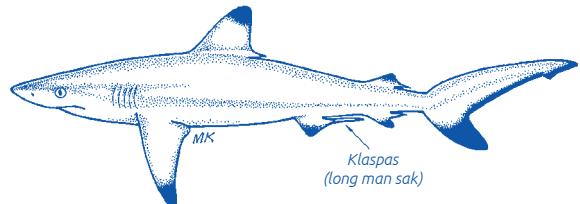
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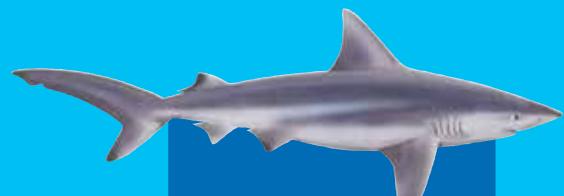
# 17

# Rif Sak

## Reef Shark (Carcharhinidae)



Lemon sak  
Sicklefin lemon shark  
(*Negaprion acutidens*)



Blaktip sak  
Blacktip shark  
(*Carcharhinus limbatus*)



Krey rif sak  
Grey reef shark  
(*Carcharhinus amblyrhynchos*)



Waetip rif sak  
Whitetip reef shark  
(*Triaenodon obesus*)



Blaktip rif sak  
Blacktip reef shark  
(*Carcharhinus melanopterus*)



### Spisis mo distribiusen

Long Pasifik, ol spisis blong sak we ol komiuniti oli kasem klosap long so blong kakae hemi ol spisis blong rif sak (family Carcharhinidae).

Ol komon spisis hemi inkludim black tip reef shark, *Carchardinus melanopterus*, blacktip shark, *Carchardinus limbatus*, grey reef shark, *Carchardinus amblyrhynchos*, lemon shark, *Negaprion acutidens*, mo whitetip reef shark, *Triaenodon obesus*.

Ol smol spisis ia oli stap long plante ples long Indo-Pasifik mo sam olsem lemon shark oli save gru kasem tri mita long longfala blong hem, be plante long ol nara spisis ia oli save gru kasem tu mita nomo. Sam long ol nara bigfala mo denjares spisis, hemia i inkludim tiger shark, mo bull shark mo man we oli fising blong mekem bisnis long fising nao oli stap kasem.

Ol sak i mas gohed blong swim oltaem blong save pulum oxygen aot long wota we i flo ova long gill blong olgeta. Be ol white tip shark, oli save pusum wota ova long ol gill mo semtaem ledaan mo stap kwaet long botom blong solwota.



### Ples we fis i stap long hem mo kakae blong hem

Ol smol rif sak oli laekem blong stap long ples we i salo, hemia ol eria klosap long so olsem ol rif flat mo korel rif. Ol yangfala sak oli save laef long eria we i salo from we i gat plante kakae. Plante spisis oli stap long wan eria nomo be blacktip shark i save muv igo farawe lelebet.

Plante long ol rif sak oli lukaotem kakae blong olgeta wanwan be oli save kam tugeta taem ol pipol i daev mo sperem fis o taem oli katem fis insaed long solwota. Gruping ia oli kolem feeding frenzy. Rif sak oli kakae ol fis olsem sadin, malet, manggru, karong mo redmaot mo tu oli kakae ol nawita mo smol naora. Plante taem ol waet tip sak oli stap slip anda long korel long dei mo oli lukaotem kakae long naet.

Ol bigfala fis olsem ol sak mo los oli stap kakae ol smol rif sak.





#17

# Rif Sak Reef Shark (Carcharhinidae)

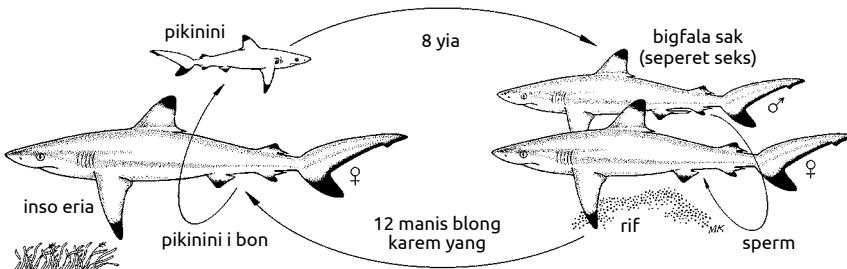


## Riprodaksen mo saekol blong laef

Ol sak oli kat seperet seks (i gat man sak mo woman sak). Ol man sak oli kat tu organ long aot saed blong bodi we oli kolem claspers we i stap andanit long bodi hemia long fored blong tel blong hem. Long taem blong go wetem woman sak man sak i putum wan long ol claspers igo insaed long hol (cloaca) blong woman sak blong givim paket blong sperm (spermatophores) long hem.

Woman sak i karem ol bebe sak insaed long bodi blong hem blong wan yia o bitim long wan yia mo hemi save bonem ten laef sak, we oli samting olsem 65 cm long longfala blong olgeta. Maet naen aot long evri ten yang sak oli ded bifo oli muv aot long ol salo wota eria.

Sak i kasem taem we oli save mekem pikinini afta eit yia taem oli kasem longfala maet long wan mita. Plante spisis oli kasem maximam saes blong tu mita taem oli gat aboot 12 yia. Afta hemi mekem pikinini, woman sak maet hemi gobak long salo wota eria we hemi bon long hem blong bonem pikinini blong hem wan.



## Ol fasin blong manejmen we yumi i save jusum

From ol sak oli prodiusim smol namba blong pikinini nomo, spisis ia i isi blong ovafis. International Union for the Conservation of Nature (IUCN) i bin klasifaem sam spisis olsem spisis we i stap long atak. Ol sak oli impoten tumas long rif ekosistem from oli karem aot ol fis we oli liko si minim se ol helti fis nomo oli stap rere blong mekem pikinini.

Gavman tru long Vanuatu fiseris dipatmen hemi gat wan sak aksen plan we i provaedem gaed blong promotem konsevesen, manejmen, developmen mo sastenebol yus blong ol sak long solwota blong Vanuatu. Aksen plan I kavaremap ol komesel fising activiti long solwota blong Vanuatu mo ol Vanuatu flag we oli stap fising raon long ol wol osen, be i no inkludim of artisanal fising vessel we oli fising blong kakai.

Ol manejmen joes blong komiuniti-bes manejmen i save inkludim ol tingting ia:

- Putum wan ban blong no fisim ol sak blong karem ol fin blong olgeta long ples blong olgeta. Evri sak we oli kasem blong kakae oli mas katemaot hed mo gill blong hem blong blad i save ron aot mo klinim gud mo karem ikam long so wetem fin blong hem i stap long hem yet.
- Setemap ol tabu eria blong smol taem nomo long taem we ol sak oli stap mit tugeta. Hemia i save inkludim ol salo eria we ol yang sak oli stap bon mo laef long hem (ol fisa oli mas save gud ol ples ia).
- Developem ecotourism we stampa tintink blong hem hemi "wajem ol sak". Ol turis i intres blong kam pem blong lukim ol sak we i no save atakem man long stret envaeromen blong olgeta. Sapos yu kasem wan sak mo salem hem yu save winim fiu hundred datu nomo be valiu blong hem i save go antap long plante taosen datu sapos ol turis i pem blong luk hem taem hemi stap laef.
- Kontrolem ol tul blong fising blong sak. Putum ban long yus blong gill net mo ol waea leaders blong fasem fis huk i go long fising laen we i naelon – ol sak oli save kakae tru long naelon laen mo ronwei wetem waea leader-ia.



## Fasin blong kasem sak

Long ol aelan kaontri blong Pasifik, ol sak oli stap kasem wetem spia, huk wetem bet, ol gill net mo trap. Sam tradisional fasin blong fis we oli save yusum hemi inkludim lassoing o noosing sak long Tonga (minim se oli kasem olgeta wetem wan ring blong rop long en blong wan longfala rop, olsem oli kasem ol hos long ol nara kaontri). Oli no kakae ol sak long sam ples, espeseli long sam pat blong Melanesia. Hemia i from sam bilif we oli save long kastom praktis blong olgeta.

Nomata we ol smol rif sak oli no denjares long yumi ol pipol, yet oli save swim hariap i kam from man hemia long taem we hemi i stap spia fising o i stanap mo fising long ol salo wota. Waet tip rif sak, blong tekem olsem eksampol, hemi save swim ikam hariap taem hemi harem saon blong masket blong daeva taem i faea.

Sak i no save pispis (wan nitrogen compound we i stap long pispis blong plante animal) be hemi holem i taet istap long blad mo mit blong hem mo hemia nao i givim strong tes blong mit blong sak. From risen ia, sak we wan fisa i kasem hemi sud katemaot hed mo gill blong hem mo wasem gud long solwota.

Oli kasem wan bigfala namba blong ol sak from fin blong olgeta, we oli yusum blong mekem sak fin soup. Evri yia oli kasem ten milian sak mo plante taem oli katemaot ol fin mo sakem i gobak long wota ol nara pat blong olgeta. Praktis ia oli kolem finning, mo risal blong hem hemi mekem se mit blong ol fis ia i wes nomo.

Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmannetwork.org](http://www.lmannetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker



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# 18

# Stingre mo ol nara flat fis

## Rays and skates



**Spot ikol rei**  
Spotted eagle ray  
(*Aetobatus ocellatus*)



**Blu spotted stingrei**  
Blue-spotted stingray  
(*Dasyatis kuhlii*)



### Spisis mo distribuisen

I gat plante spisis blong fis we komon nem blong olgeta i ol skate, stingray mo eagle ray. Olgeta oli sem mak long sak, from skeleton blong olgeta i no bon, be wan kaen materiel we i strong mo lastik, olsem ej blong sora blong ol man, be olgeta oli gat wan bodi we i flat mo fin blong olgeta we i stap long saed oli olsem ol wing (pectoral fins). Ol wing ia we i provaedem plante long ol mit i no karem soup needle (finrays) olsem we i stap long fin blong sak, minim se ol man oli no lukaotem olgeta olsem ol sak long fishing industri blong sak fin.

I gat sam spisis we oli stap kakae long ol aelan blong Pasifik mo tufala eksampol blong hem i spotted eagle ray, *Aetobatus narinari*, mo blue-spotted stingray, *Dasyatis Kuhlii*. Spotted eagle ray, we i gat plante waet spot long wan dak blu/grin bodi blong hem mo wingspan blong hem i 2.5 mita, hemi komon truaot long tropikal Indo-Pasifik. Blue-spotted stingray, we bodi blong hem i braon wetem ol laet blu spot, we wingspan blong hem i save kasem 35 sentimita, hemi komon long ol ples we i gat sanbij long ol korel rif akros long Pasifik.

Plante stingre oli gat wan o mo naef we wan tintin skin i kavremap olgeta, we posen (venom) i haed long hem. Long taem bifo, sam long ol komiuniti blong Pasifik oli yusum ol naef ia blong mekem hed blong spia mo aro blong olgeta.



### Ples we fis i stap long hem mo kakae blong hem

Plante spisis oli stret blong stap laef long botom blong solwota mo oli save tekem wota i go insaed long olgeta tru long ol bigfala hol we nem blong hem i spiracles, i no tru long maot blong olgeta olsem ol nara kaen fis. Plante spisis i stap kakae long botom blong solwota we i gat sof sanbis long hem be eagle ray mo giant manta ray oli swim tru long wota blong kasem kakae blong olgeta.

Klosap evri spisis i gat ol hevi raon tut blong brekem ol sel blong ol animol we oli stap long botom blong solwota olsem ol si snel, nata-lae, oista mo krab. Olgeta oli kakae tu ol wom, smol naora mo sam kaen fis. Be ol manta ray, we olgeta i lelebet sem mak long olgeta, oli tekem plante wota long maot blong olgeta mo aot long hem oli kakae ol smolsmol animol (plankton).

Ol men animol we oli stap kakae ol smol stingre long ol tropikal wota hemi ol sak mo ol bigfala spisis blong fis.





#18

# Stingre mo ol nara flat fis

Rays and skates



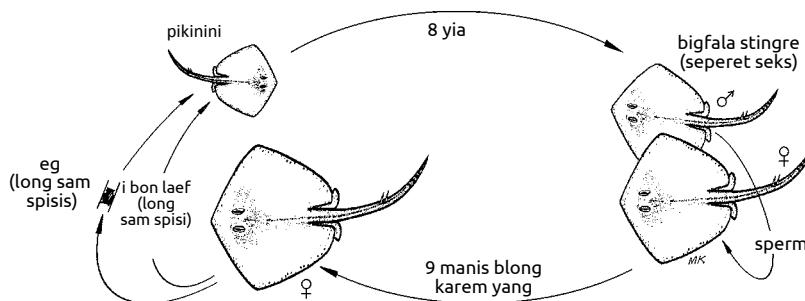
## Riprodaksen mo saekol blong laef

Olgeta stingre mo skate oli gat seperet seks mo eg i fetalaes insaed long bodi blong woman fis – ol man fis oli pasem sperm i go long ol woman fis we oli bonem ol pikinini we i laef o oli putum aot ol bigfala eg wetem strong skin.

Man stingre hemi gat tu riprodaktiv pat blong hem we nem blong hem claspers we i stap aotsaed mo andanit long bodi blong hem. Long taem blong mekem pikinini, man stingre (♂) hemi yusum wan long tufala claspers blong putum sperm igo insaed long hol (cloaca) blong woman stingre (♀).

Long plante blong ol spisis blong stingre, woman stingre hemi karem ol yang wan blong hem insaed long bodi blong hem blong naen (9) manis bifo i bonem samples long 15 laev yang stingre, we oli save swim mo go lukaotem kakae wetem mama blong olgeta. Long sam spisis, we oli kolem olgeta ol skate, woman fis hemi putum wan eg we skin blong hem i strong long botom blong solwota. Ol eg (sam taem oli kolem “mermaid’s purse”) oli brok mo prodiusim ol yangfala ray we oli luk olsem ol bigfala ray.

Plante stingre mo skate we oli bin stadi long olgeta oli gru sloslo, mo wan aot long ten pikinini i save laef blong 8 yia o mo bifo oli kasem taem blong mekem pikinini. Olgeta oli kat wan laef span blong abaot 30 yia.



## Ol fasin blong manejmen we yumi i save jusum

From oli gru slo mo oli mekem smol namba blong pikinini evri yia, oli no mas kasem tumas long olgeta.

Long sam stingre, woman fis hemi save kasem taem blong mekem pikinini long wan bigfala saes mo wan ej we i bigwan lelebet, mo hemia i mekem se saes limit hemi had blong yusum. Mo tu hemi denjares blong meserem wan stingre we oli jes kasem mo i stap muv smolsmol yet.

Ol fasin blong komiuniti-bes manejmen hemi inkludim ol aksen ia. Fes tu aksen we yu save jusum i posibol sapos spisis we yu intres long hem oli go grup tueta blong mekem pikinini long wan eria mo long wan taem mo infomesen ia ol lokol fisa oli save. Plante spisis blong stingre mo skate oli go tueta blong stap long wan grup we i no gat tumas fis long hem.

→ Setemap ol tabu eria long ples we ol stingre oli save go stap tueta long hem. Fasin blong stopem fising long ol eria ia i save helpem ol spisis we ol lokol fisa i save se oli stап go grup tueta long eria ia.

→ Stopem fising blong stingre long taem we oli go tueta blong mekem pikinini. Fasin blong stopem fising long taem olsem i save helpem ol spisis we ol komiuniti oli save se oli stап go tueta blong mekem pikinini long kaen taem olsem. Plante spisis oli go tueta wan taem nomo long wan yia we maet hemi rilet long saekol blong mun.

→ Dvelopem ecotourism raon long tingting se ol turis i wantem kam lukim stingre. Plante turis oli save pem blong kam luk ol stingre long stret envaeromen blong olgeta. Stingre i save kam stап kwaet sapos oli trenem olgeta blong kam blong tekem kakae long wan taem we oli save long hem.

## Fasin blong kasem stingre

Stingre oli kasem wetem spia mo bet long huk mo laen. Olsem sak, stingre oli holem pispis (nitrogen compound we i stap long pispis blong plante animal) insaed long blad mo mit, mo oli mas letem blad blong hem i ron kwiktaem taem taem oli kasem stingre mo mas wasem mo sokem gud mit blong hem long wota.

Plante spisis oli denjares, from naef blong olgeta i posen. Be mos long ol stingre oli swim i go aot taem we wan man i stap go klosap long olgeta taem i stap wokbaot long salo wota.



Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tueta wetem LMMA ([www.lmannetwork.org](http://www.lmannetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker



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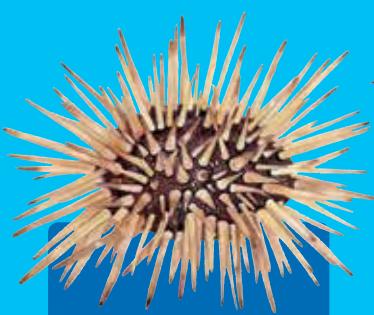
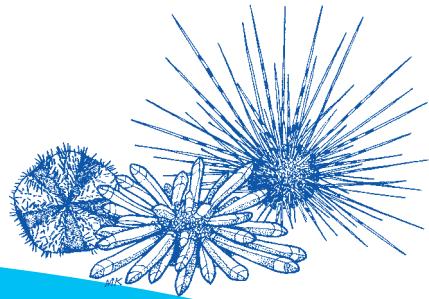


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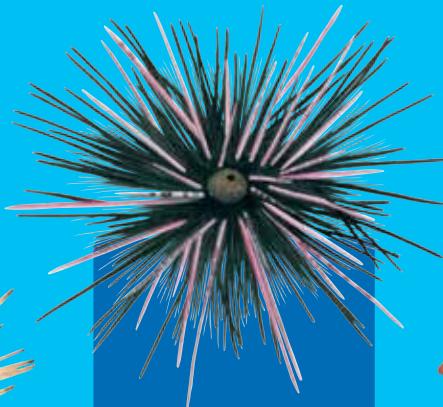


# 19

# Si ejen Sea urchin



**Pilo sta si ejen**  
Hedgehog sea urchin  
(*Echinometra mathaei*)



**Blak sta si ejen**  
Coarsely spined urchin  
(*Echinothrix diadema*)



**Pensel si ejen**  
Red slate-pencil urchin  
(*Heterocentrotus mamillatus*)



**Straep si ejen**  
Striped sea urchin  
(*Tripneustes gratilla*)



## Spisis mo distribiusen

*Si ejen i gat wan raon bodi wetem maot blong hem i stap daon mo as blong hem i stap antap. Olgeta oli muv long smol tiub olsem ol leg blong olgeta we i gat ol saka. Olgeta i gat wan strong sel (we oli kolem test) wetem ol spaen we oli save muvum mo we oli gat ol difren saes.*

Ol nidil blong blaksta, *Diadema*, wan kaen si ejen, i save gru ova long 30 cm long mo oli gat posen insaed long olgeta we i save mekem bodi i soa tumas taem i stikim wan pat blong bodi. Ol nidil blong pensel sta, *Heterocentrotus*, oli hevi mo oli no sap mo oli save helpem hem blong fasenem hem insaed long ol krak long korel rif. Spisis *Echinometra* mo short-spined urchin, *Tripneustes gratilla*, sam long ol aelan kaontri blong Pasifik oli stap yusum olgeta olsem kakae. Oli luk se *Tripneustes gratilla* i wan gud spisis blong gru long wan akwakalja projek.

Ol si ejen oli stap long ol wota we i no hot tumas mo long ol tropikal wota raon long wol mo oli wan stampa blong komesel Fiseris. Si ejen i gat faev (5) reproduktiv ogen (gonads o roe) we i stap insaed long sel blong hem mo hemia nao oli stap kakae olsem wan spesol kaen kakae long sam kaontri.



## Ples we ol si ejen oli stap long hem mo wanem oli kakae

Ol yang si ejen oli laekem stap long ol eria we i gat plante ston we oli save haed mo ol ejen we oli bigwan finis oli laekem ol open botom blong solwota we i gat sam samting we oli save stap haed anda long hem. Olgeta oli save muv ova long botom blong solwota blong kakae ol si gras, nalu碌um mo sam taem oli save kakae ol smol animol wetem ol faev sap tut blong olgeta. Plante ejen oli mekem wan impoten wok long helt blong rif taem oli stap kakae ol nalu碌um we i save kilim korel.

Long tropikal wota, ol stingre, puffer fish, strongskin fis mo ol nawita oli stap kakae ol si ejen.





#19

# Si ejen Sea urchin

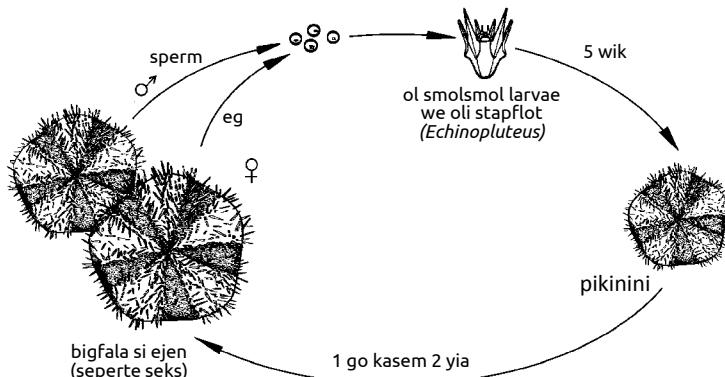


## Riprodaksen mo saekol blong laef

Si ejen oli kat seperet seks, be tufala, woman mo man, oli luk sem mak long aotsaed blong bodi blong tufala. Long plante spisis, long taem blong mekem pikinini, i gat bigfala namba blong ol si ejen we oli kam wamples long taem ia.

Woman si ejen (♀) i save kivim aot sam milian eg mo man si ejen (♂) i save kapsaetem sperm i go long wota. Ol eg we oli fetalaes oli save develop kwiktaem blong kam wan larva we sep blong hem i olsem kon mo i save swim, we maet i stap long plankton long 5 wik. I gat smol namba nomo aot long wan milian pikinini we i save laef blong foldaon i go long botom blong rif mo jenis i kam wan bigfala si ejen.

Plante long ol tropikol spisis blong si ejen i rere blong mekem pikinini taem oli gat abaat tu yia. Ol pilo sta oli gru kwiktaem blong rere blong mekem pikinini taem oli kasem 75 mm long fes yia mo oli save laef blong 2 kasem 5 yia mo kasem wan saes blong 160 mm.



## Ol fasin blong manejmen we yumi i save jusum

Ol kaen kontrol olsem hamas kilo nomo blong kasem (catch quotas) mo givim laesens blong fising long ol fisa i stap kontrolem haves mo bisnis blong fiseris ia. Ol manejmen mesa ia oli no save yusum long komiuniti we oli kolektem ol si ejen blong kakae. Long mos long ol aelan blong Pasifik oli no yusum eni kaen kontrol long koleksen blong si ejen.

Ol memba blong komiuniti blong fisa oli save mekemap tingting blong olgeta sapos ol namba blong si ejen i go daon kwiktaem o nomo. Oli save luk se i gat ovafising sapos i nidim fulap taem blong wan man i pikimap wan basket blong si ejen.

Sipos plante si ejen i bin aot long wan rif mo namba blong si ejen i smol tumas, maet ol si ejen we oli stap yet oli stap seperet longwei tumas long ol nara wan, minim se ol eg we ol woman si ejen oli letemaot oli no save fetalaes wetem sperm blong ol man si ejen. Ol si ejen oli mas stap klosap long olgeta narawan mo oli mas gat plante long olgeta blong oli save riprodius.

Long ol komiuniti we oli ting se populesen blong si ejen i go daon plante, ol posibol aksen we maet oli save tekem i inkludim:

→ Stopem haves blong karem mo salem ol si ejen tru long wan bisnis. Olgeta si ejen we i stap oli mas kipim olsem kakae blong lokol komiuniti.

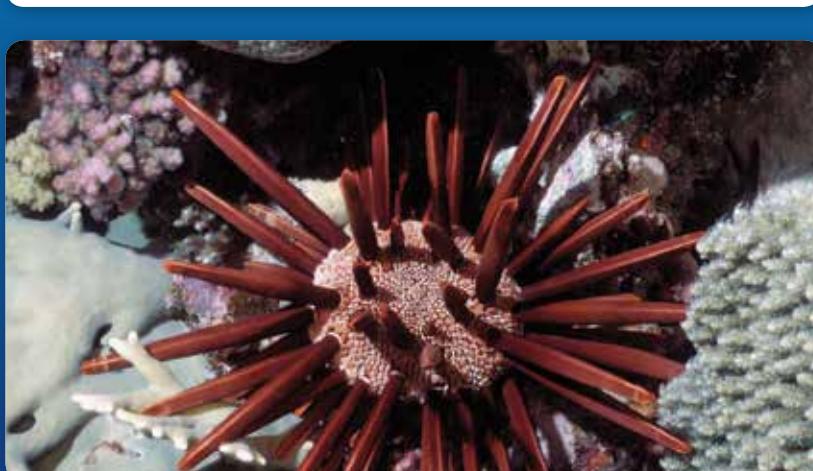
→ Stopem yus blong ol ekwipmen blong pulum win anda long solwota blong karem si ejen. Blong haves tem si ejen komiuniti i mas yusum han nomo.

Sapos taem mo ples we ol si ejen oli stap go tugeta blong mekem pikinini hemi pat blong tradisonal save blong komiuniti, ol aksen we maet oli save tekem i olsem:

→ Setemap wan smol tabu eria we komiuniti i stap manejem. Hemia i save inkludim ples we ol si ejen oli kam tugeta blong mekem pikinini mo prodiusim ol smolsmol larvae we oli save flot mo setel long ol fising graon we i stap klosap. Sapos oli no save mekem wan tabu eria, ol aksen olsem maet i possibil:

→ Protektem ol si ejen long taem blong mekem pikinini. Olsem, oli mas klosem fising long ol eria we oli go tugeta long sam wik.

Sipos namba blong si ejen i go daon plante, wan nara aksen we oli save tekem hemi blong kolektem ol bigfala si ejen long ol nara rif mo karem ikam wamples blong mekem pikinini long tabu eria; bifor komiuniti i traem mekem olsem, hemi mas askem help blong ol lokol fising otoriti mo ol man blong saens.



Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmannetwork.org](http://www.lmannetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker - Philippe Amiot



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Improving the practice of marine conservation



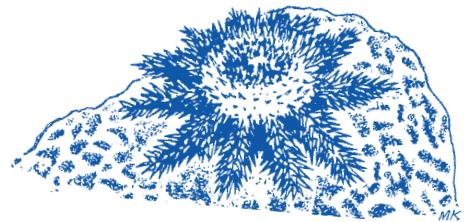
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#20

# Posen stafis

## Crown-of-thorns (*Acanthaster planci*)



**Posen stafis**  
Crown-of-thorns  
(*Acanthaster planci*)



### Spisis mo distribiusen

Posen stafis, *Acanthaster planci*, hemi wan bigfala grin/braon stafis o si sta we i kat 23 han. Longfala blong han blong hem, stat long en blong wan han blong hem kasem en blong nara han hemi 35 cm mo bodi blong hem i fulap long ol sap nidil we oli kasem 5 cm. Hemi laef olsem ol nara animal long korel rif truaot long Rijon blong Indo-Pasifik.

Long skin blong ol nidil blong posen stafis ia i gat posen we nem blong hem hemi saponin. Taem we i stikim wan man o woman (oltaem andanit long leg taem i stap wokbaot long salo solwota) i save mekem leg i soa we i soa, mo i save mekem hed i raon mo mekem hem i troaot. Eni nidil we i stap insaed long leg oli mas karemaot gud, mo ples we nidil i stikim leg oli mas wasem wetem hot solwota mo putum wan bandej we i no mas taet tumas. Sapos we soa long ples we nidil i stikim hemi i kam nogud, maet i gat nid blong yusum wan merisin olsem antibiotic.

Nomata we i no gat eni kaen pruf long saens se i save wok, wan komon tradisionel fasin blong tritim yu sapos posen stafis i stikim yu hemi blong holem andanit blong posen stafis ia wetem maot blong hem ova long ples we hemi stikim yu.

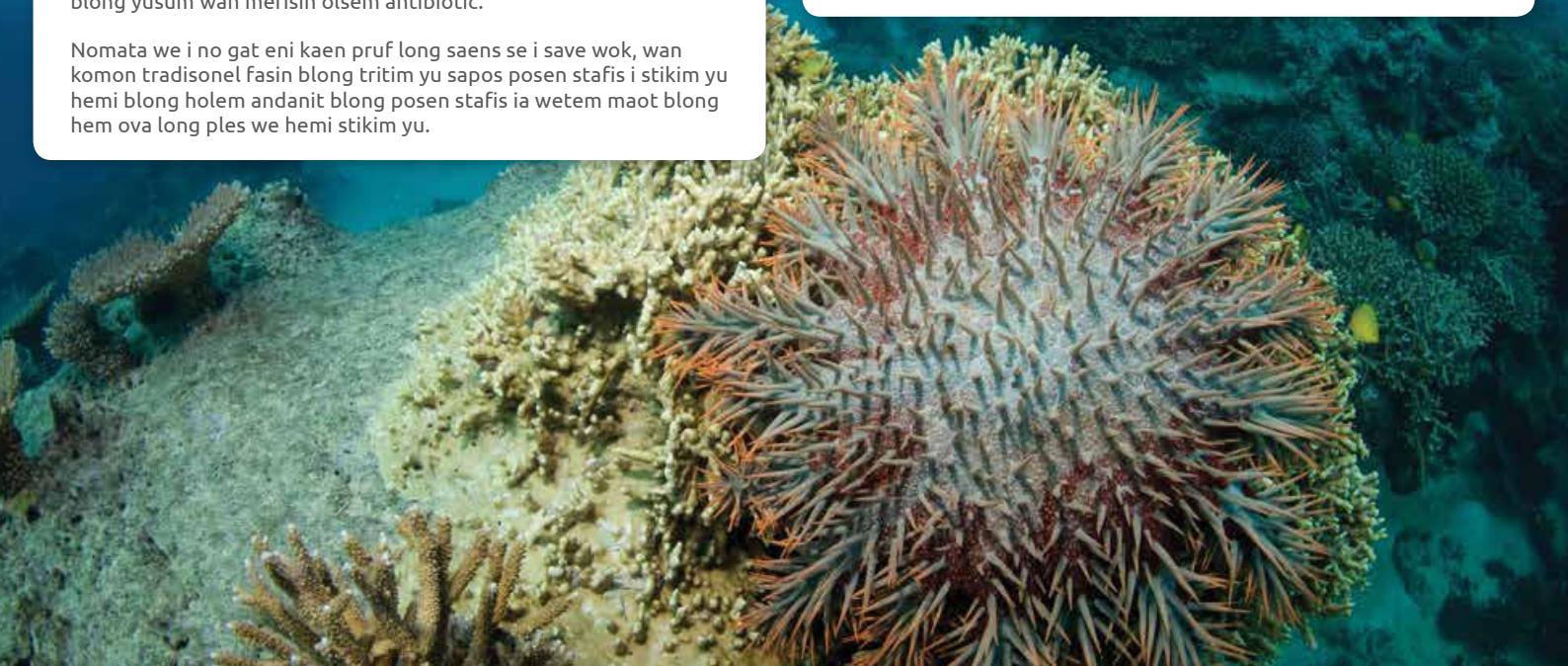


### Ples we posen stafis i laef long hem mo kakae blong hem

Posen stafis i laekem stap long ples we i save haed mo i no gat tumas wef olsem long lagun mo ples we wota i dip long fored blong rif. Oli yusum ol bigfala namba blong smol fut we i olsem tube we istap andanit long han blong olgeta blong muv.

Long korel, posen stafis i pusum aot bel blong hem mo kakae ol bebet blong korel we oli singaotem olgeta coral polyps (ol smol animal we oli fomem korel). Afta we hemi kakae, hemi muv igo mo livim bihaen long hem wan waet skeleton blong korel we i ded.

Taem oli gat fiu nomo long wan ples, posen stafis i laekem blong kakae ol branjing korel we oli stap gru hariap, hemia i alaoem ol korel we oli gru slo nomo blong tekem ples blong ol korel we oli ded. Taem posen stafis i plante, oli kakae tu ol bigfala korel we oli gru slo olsem ol bren korel mo ol bolda korel.





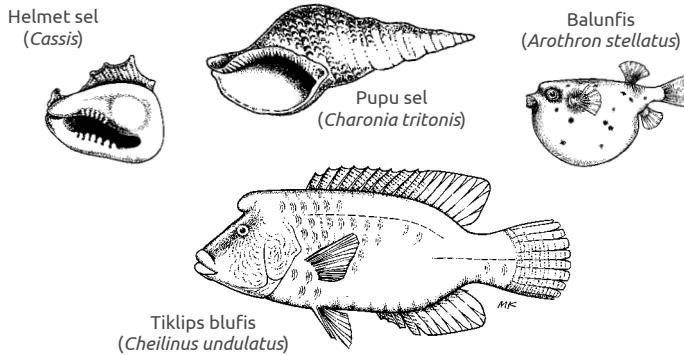
#20

# Posen stafis (*Acanthaster planci*)



## Ol animal we oli stap kakae posen stafis

Ol animal we oli stap kakae ol posen stafis oli inkludim ol bigfala sel olsem bubu sel mo bigae, mo tu ol fis olsem napoleong mo starry puffer fish.



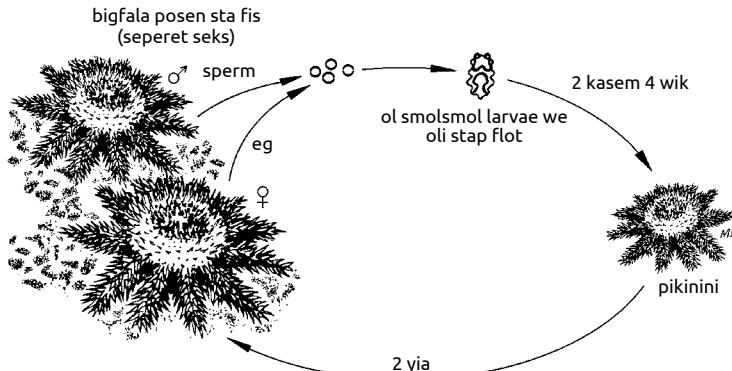
## Riprodaksen mo saekol blong laef

*Posen star fis i gat seperet seks mo oli save mekem pikinini taem oli kasem abaot tu yia, hemi taem we oli kasem 20 cm long en blong wan han go kasem en blong han long nara saed.*

Ol woman mo man posen stafis oli kam grup tugeta mo rilisim eg mo sperm blong olgeta igo long wota tru long ol smol hol antap long bodi blong olgeta. Wan bigfala woman stafis hemi save prodiusim plante milian eg truaot long wan sison blong mekem pikinini.

Ol eg we oli fetalaes oli brok mo ol smolsmol larvae we i kam aot oli spendem tu kasem fo wik blong flot folem taed long solwota. I gat fiu nomo, maet wan aot long wan milian, we oli laef blong setel long ol rif, we oli jenis long tu dei nomo blong kam ol pikinini stafis.

Fastaem ol pikinini posen stafis oli kakae ol nalumllum blong solwota (korelaen nalumllum) be afta sikis manis, long wan saes blong wan sentimita, oli stat blong kakae ol korel mo maet oli stap laef go kasem eit yia.



## Ol fasin blong manejmen we yumi i save jusum

*Bigfala populesen o outbreak blong posen stafis ia (taem we kwiktaem i gat wan bigfala namba tumas) i save damejem ol bigfala eria blong korel. Ol aotrek ia oli save tekem ples long wan najarol fasin nomo be oli save tekem ples tu folem ol aktiviti blong ol man - olsem blong alaoem ol doti blong septik tang blong kasem solwota mo tu taem oli kasem plante tumas long ol animal we oli stap kakae olgeta stafis ia.*

Ol fasin blong kontrolem aotrek blong posen stafis we oli bin stap traem oli inkludim injeksen blong kemikol olsem sodium bisulphate. I gat injeksen blong laem tu wetem viniga we saens hemi bin pruvum se hemi save kilim ol posen stafis ia. Be han koleksen blong posen stafis hemi fasin we i gud tumas blong yusum taem we i kat plante wokman blong mekem.

Ol aksen we komiuniti i save takem i olsem:

→ Luk long namba blong posen stafis. Namba we hemi smol olsem fo posen stafis we oli faenem long wan daev blong twante minit long wan stret laen we i krosem wan korel rif hemi soem se i no gat aotrek o tumas damej long korel long eria ia mo i no nidim blong tekem wan aksen. Be sapos namba I hae bitim fo, i mas gat aksen i tekem ples olsem:

→ Jusum eria we i gat nid blong gat klinap long hem. Wan smol eria betwin 2 mo 4 hecta hemi wan gudfala eria blong tagetem mo maet i inkludim komiuniti fising eria, wan tabu eria, wan eria we ol turis oli stap go visitim o wan ples we gat plante kaen korel we istap gru long hem. Sapos ol turis i visitim eria ia, maet yu save askem olgeta blong givhan long grup we i mekem klinap ia.

→ Organaesem wan bigfala namba blong olgeta we i joenem grup blong kolektem ol posen stafis. Ol pipol ia oli mas rere blong stap long klinap dei mo karem ikam wetem olgeta ol spia o long-handel aean blong karemaot posen stafis. Kaen koleksen we pipol oli wokbaot long rif hemi denjares sapos solwota i no klia gud - be koleksen we olgeta i swim wetem glas blong daeva hemi sef lelebet.

→ Kolektem ol posen star fis mo karem olgeta i go so. Ol kolecta oli sud muv long wan laen blong krosem eria, mo sem taem lukaot gud blong no stanap long ol korel mo damejem olgeta taem we oli stap karem ol posen stafis. Oli sud go putum olgeta long wan samting olsem wan bin we i save flot o wan smol bot blong karem olgeta i go so.

→ Wanem blong mekem wetem posen stafis long so. Posen stafis oli save yusum olsem fetalaesa sapos oli putum olgeta insaed long wan hol mo kavremap wetem graon mo afta planem ol samting olsem banana o lemon tri antap long hol ia.

→ Aotrek we i save rilet long hae nutrien long solwota. Help i save kam tru long dipatmen blong envaeromen blong adresem problem ia.



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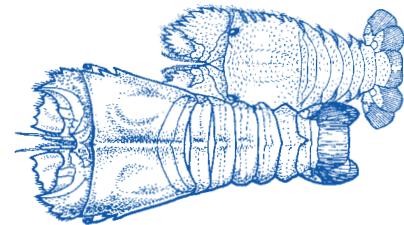




#21

# Flat naura/ Slipa naura blong solwota

## Slipper lobster (Scyllaridae)



**Slipa naura**  
Caledonian slipper lobster  
(*Parribacus caledonicus*)



**Flat hed naura**  
Flathead lobster  
(*Thenuis orientalis*)



### Spisis mo distribiusen

Ol crustacean we komon nem blong olgeta i slipper, shovel nosed o mitten lobster, oli klosap sem mak wetem ol naora blong solwota (Pepa blong toksave namba 13) be bodi blong olgeta i flat.

I gat sam spisis we oli kasem blong kakae long ol aelan blong Pasifik be i gat fiu nomo we oli diskraebem long pepa ia.

Oli inkludim Caledonian slipper o mitten lobster, *Parribacus caledonicus*, we i save gru kasem wan longfala blong 180 milimita mo i stap long plante ples long wes blong Pasifik Osen.

Hawaiian o sculptured slipper lobster, *Parribacus antarcticus*, i stap long evri solwota inkludim Pasifik Osen mo i save gru kasem wan saes blong 200 milimita.

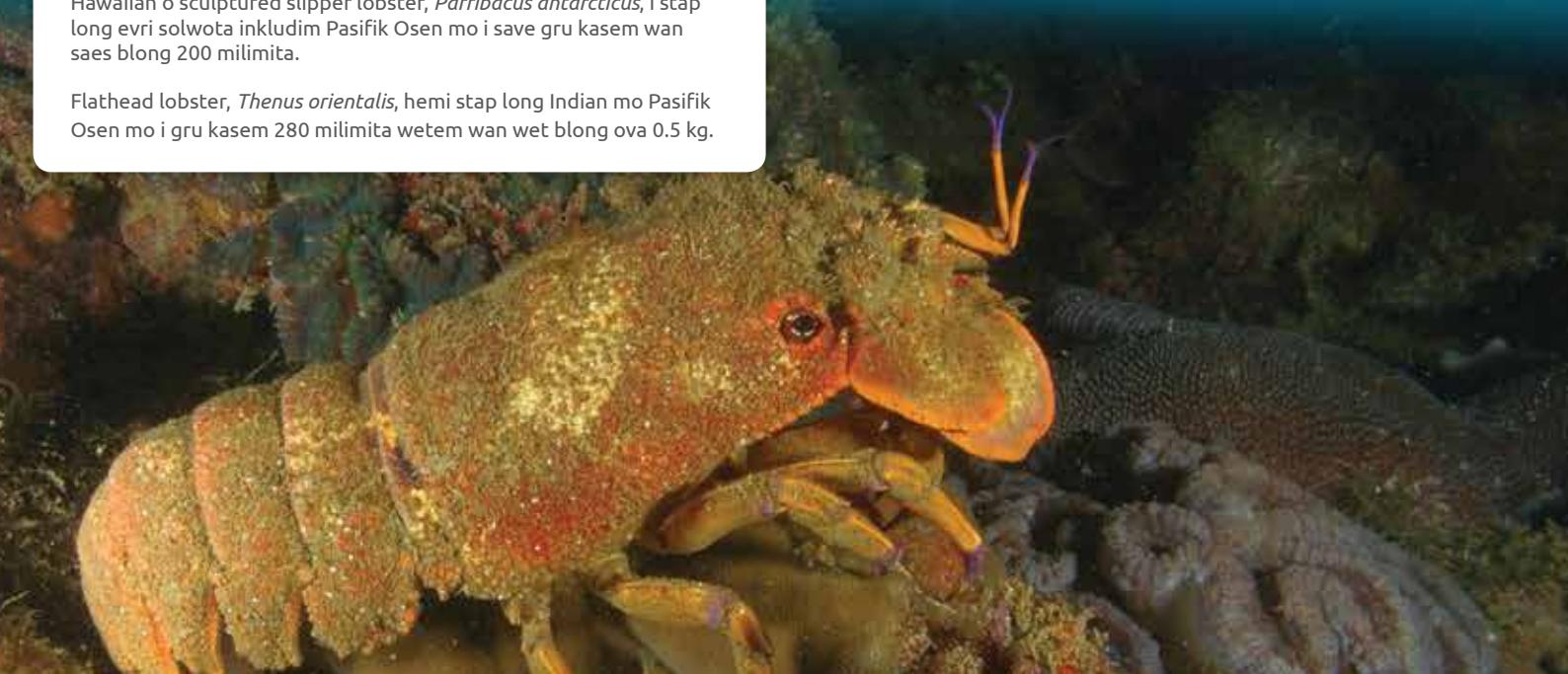
Flathead lobster, *Thenuis orientalis*, hemi stap long Indian mo Pasifik Osen mo i gru kasem 280 milimita wetem wan wet blong ova 0.5 kg.



### Ples we flat naora hemi stap long hem mo kakae blong hem

Flat naura oli ol animal we oli laef daon long botom blong solwota long ol salo wota blong ol lagun mo insaed long ol krak o hol blong ol ston long rif. Plante spisis oli kakae long naet mo go insaed long sanbij o haed long rif long dei. Sam, olsem Caledonian mitten lobster, i laef long wan hol o nes we hol blong go insaed long hem i smol olgeta.

Flat naura oli kakae ol defren kaen sel, olsem limpet, mussel mo oista mo oli kakae tu ol smol naora, krab, wom mo si ejen. Ol animal we oli stap kakae ol flat naura i inkludim ol strong skin fis, ol los mo nawita.





#21

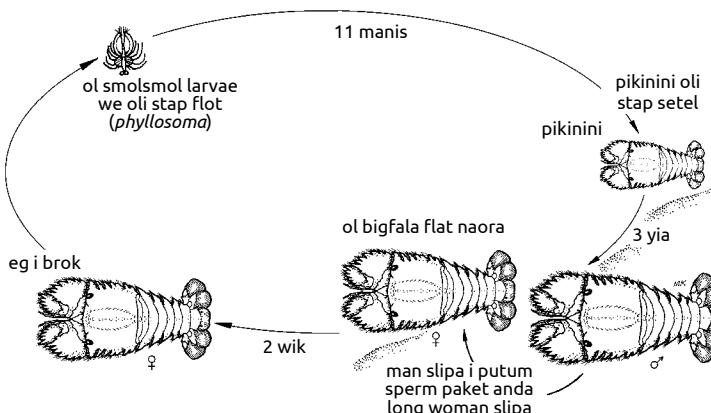
# Flat naura / Slipa naura blong solwota



## Riprodaksen mo saekol blong laef

*Flat naura oli kat seperet seks, hemi minim se i kat man (♂) mo woman (♀) naura, mo oli rere blong mekem pikinini taem oli kasem 3 yia.*

Long taem blong mekem pikinini, man naura (♂) i putum wan paket blong sperm (spermatophore) igo long andanit blong woman naura (♀). Wan woman naura i givim aot wan bigfala namba blong eg we i save kasem 100,000, we hemi karem andanit long bodi blong hem blong 2 wik or bitim long taem ia oli stap jenkal kala long orenj i go long braon. Taem ol eg i brok ol smolmol larvae oli kam aot long olgeta mo oli flot long solwota blong 11 manis. Aot long evri taosen blong ol smolmol larvae ia, anda long wan i save laef blong setel long botom blong solwota blong kam wan pikinini flat naura. Mo aot long evri wan hundred pikinini, anda long wan i stap laef blong kam wan bigfala naura we i save mekem pikinini mo maet hemi laef go kasem 10 yia.



## Fasin blong kasem flat naura

Ol flat naora we i laekem stap long ol ples daon long botom blong solwota we i gat sanbij, olsem spisis blong *Thenus*, plante taem oli stap kasem olgeta wetem ol net we oli pulum bihaen long bot o long ol bet trap. Olgeta we oli laekem stap long ol rif (we i inkludim ol *Parribacus* spisis) oli stap kasem olgeta long naet wetem han o oli daeva wetem spia. Samtaem oli yusum ol ekwipmen blong pulum win anda long solwota olsem SCUBA.



Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmannetwork.org](http://www.lmannetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, you save luk long gaed buk. Foto : Mathieu Juncker



T.Babouline



## Ol fasin blong manejen we yumi i save jusum

Long Vanuatu, dipatmen blong fiseris i bin putum wan minimam saes limit we hemi 15 sentimita, stat long en blong sel blong hed blong kasem en blong sel blong tel blong hem. Evri flat naura we longfala blong hem i no kasem 15 cm oli no alao blong karem. I no alao blong givim kil, karem o traem blong kilim eni flat naura wetem spia on eni narafala samting we en blong hem i sap.

Regiulesen ia i blokem ol fisa blong no karem eni woman flat naura we oli karem eg. I no aloa tu blong karemaot eg blong wan flat naura o karem wetem hem, salem o pem eni flat naura we oli karemaot ol eg blong hem. Mo oli no mas ekspotem eni pikinini blong eni crustacean (inkludim ol flat naora) sapos Daerekta blong Fiseris i no bin otoraesem.

Panismen blong brekem ol rul ia blong wanwan man hemi VT 200,000 maximam; mo blong wan kampani o asosiesen o koperet bodi hemi VT 1,000,000 maximam.

Sam long ol narafala aksen we komiuniti i save mekem hemi blong:

- Stopem blong no yusum ol tul blong pulum win andanit long solwota. Kaen fasin ia oli stap yusum taem i gat wan kampani we i stap pem flat naora, we i save karem ol bigfala flat naura aot long wan rif eria.
- Putum wan minimam saes blong flat naura sapos komiuniti i gat gud helti namba blong bigfala saes. Setemap wan minimam saes we i hemi olsem nasonal minimam saes long komiuniti blong protektem namba blong flat naura long ol rif raon long komiuniti.
- Rotetem fising eria blong flat naura long defren rif. Wanwan rif eria i save open blong fising blong wan yia afta i klos blong tri yia blong alaoem ol pikinini blong naura i save gru i kam bikwan.
- Stopem fising long taem blong mekem pikinini. Plante long ol local fisa oli save gud long taem we naura i stap karem eg. Stopem fising long ol manis we naora i gat eg blong alaoem populesen blong flat naura i kambak plante.
- Aplaem limit long namba blong naura we oli save kasem. Setemap limit, olsem bag limit, o catch quota, we i stret blong ol fisa i save yusum blong kasem flat naura blong salem. Limit ia i save putum, olsem 10 flat naura nomo we wan man i save kasem long wan dei.

Ol smol flat naura we oli stap olsem smolmol larvae oli save flot long solwota blong klosap wan ful ia bifo oli save setel long ol rif we oli stap aot long wan long distens. Hemia i minim se wan komiuniti nomo i no save manejen gud fiseris blong flat naura blong hem. Wan gudfala wei hemi blong ol komiuniti we oli stap klosap long solwota oli wok tugeta mo agri blong aplaem sem manejen mesa.



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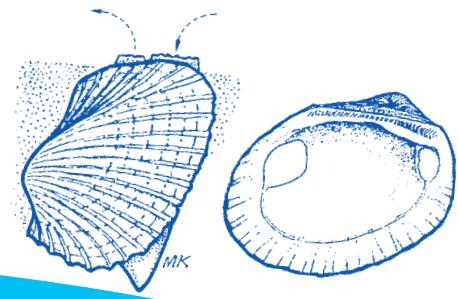
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#22

# Kokias/Ark clam

## Ark clam (*Anadara*)



**Kokias**  
Antique ark  
(*Anadara antiquata*)



### Spisis mo distribiusen

Kokias (ark clam or ark shell), hemi wan kaen selfis (mollusc) we i gat tu haf blong hem. Hemi anda long 80 mm long, wetem tik, waet mo braon kala sel wetem ol strong laen long hem. I no olsem ol nara natalae, from kokias ia i gat blad we i red (haemoglobin), we i karem oxygen igo long mit blong hem blong alaoem olgeta blong save laef long wota we i gat sofmad long hem mo we i no gat plante oxygen long hem.

I gat samples 200 difren spisis blong kokias mo olgeta we oli blong genus grup *Anadara* oli stap long plante ples long Pasifik.



### Ples we kokias i stap long hem mo kakae blong hem

Kokias i laef long ples we wota i no dip tumas mo i stap haed insaed long ol ples we sandbij i miks wetem sofmad, long sofmad mo long ples we si gras i gru long hem. Long sam eria, smol kokias oli plante klosap long so, mo ol bigfala wan oli stap long ples we i dip lelebet. Ol yang kokias i save setel long sanbij mo si gras mo muv igo long ples we i gat sofmad wetem plante kakae long hem taem oli gru i kam antap.

Kokias i kakae taem i stap pulum wota i kam insaed long hem long wan hol mo tekemaot ol kakae we i stap long hem, mo afta pusum wota i go aot bakegen long nara hol (tufala aro long pikja i soem hao wota i stap muv tru long hem). Ol animal we oli stap kakae ol kokias i ol fis we oli stap kakae mit taem sel i stap open, mo ol bigfala fis olsem stingre we oli save brekbrekem sel wetem strong maot blong olgeta.





#22

# Kokias/Ark clam Ark clam (*Anadara*)

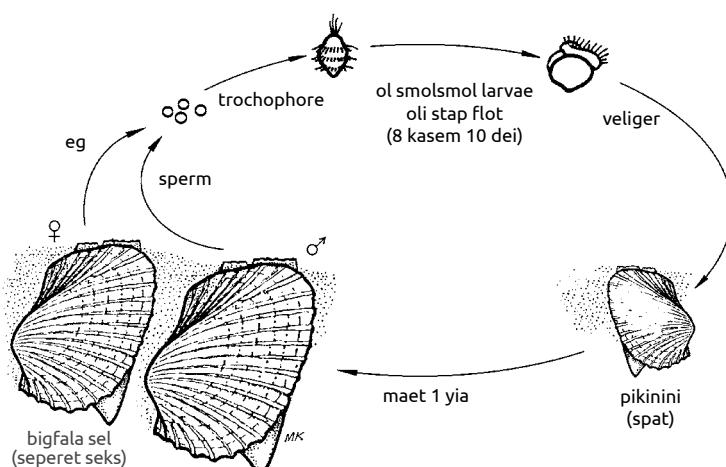


## Riprodakseen mo saekol blong laef

**Kokias i gat seperet seks (minim se i gat man kokias mo woman kokias) mo oli kasem ej blong mekem pikinini taem we oli kasem wan yia mo wan saes blong 20 milimita.**

Long taem blong mekem pikinini, we maet i tekem ples long stat long wet sison, woman sel (♀) i givim aot plante taosen eg i go long wota mo ol eg ia i fetalaes wetem sperm we man sel (♂) i kapsaetem.

Ol eg we i fetalaes oli brok mo ol smolsmol larvae oli kamaot mo oli flot wetem taed long solwota blong eit kasem ten dei. Aot long evri taosen larvae, anda long wan i save laef blong setel long botom blong solwota olsem pikinini (we samtaem oli kolem hem spat). Mo aot long evri hundred pikinini, anda long wan i save laef blong kam wan bigfala kokias we i save mekem pikinini taem hemi gat sikis o mo yia mo hemi kasem 80 milimita.



## Ol fasin blong manejmen we yumi i save jusum

Long plante kaotri long Pasifik inkludim Vanuatu i no gat eni kaen manejmen kontrol we oli putum long ol kokias. Be sam komiuniti long Fiji oli bin setemap minimam saes limit blong 3 sentimita (we yu save mesarem wetem finga), mo tu oli klosem haves long taem blong mekem pikinini mo putum ol tabu long wan long taem long sam eria blong protektem ol kokias we oli mekem pikinini.

Opsen blong komiuniti-bes manejmen hemi olsem:

- Putum ban long yus blong evri tul blong fising be alaoem nomo fasin blong pikimap wetem han.  
Ol fisa oli stap karem kokias long wota we i kasem 1.5 mita nomo. I posibol se plante kokias oli laef long ol ples we i dip mo, we i minim se olgeta i gat janis blong mekem pikinini blong putum i gobak long ol salo eria we oli stap fis long hem.
- Klosem fising long taem we ol kokias i mekem pikinini. Komiuniti i save putum wan tabu long ol fising graon blong kokias, blong mekem se olgeta i save prodiusim plante pikinini.
- Mekem ol tabu eria we oli stap oltaem. Long ol eria ia i mas gat wan big populesen blong kokias blong mekem riprodaksen i efektif. Tabu eria maet i save wok gudwan mo, sapos oli introdusim sam kokias aot long ol nara eria. Ol smolsmol larvae we oli kam aot long tabu eria plante long olgeta i save flot mo sidaon olsem pikinini kokias long ol eria we i klosap. Mo oli save gru go kasem wan taem long fiuwa we oli save kolektem olgeta. Long Fiji, taem oli protektem ol sel taem oli mekem pikinini, oli ting se oli inkrisim namba blong sel long 200% long ol eria klosap we oli fising long hem.
- Wok wetem ol local otoriti blong katem daon damej long ol ples we kokias i stap long hem. Kokias i save gat posen taem i gat tumas polusen long wota long ples we oli stap long hem, from we ol wota blong septik tang, wota we i ronaot long ol graon blong agrikalja, silt we i save kam antap long graon tru long divelopmen mo tru long praktis blong tekem sanbis blong mekem ol haos i save go daon long solwota mo mekem hem i doti.

Sapos eria blong fising blong komiuniti i bigwan, wan nara kaen fasin blong manejmen hemi blong praktisim rotesonal havesting blong ol kokias.

- Setemap rotesonal havesting. Wan komiuniti fising eria i save divaed igo long ol smolsmol eria we i save gat fising long wan eria blong wan yia nomo. Blong tekem wan eksampol, sapos i gat tri smol eria, wanwan eria i save gat tu yia blong proteksen we i no gat fising long hem.



Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmannetwork.org](http://www.lmannetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker



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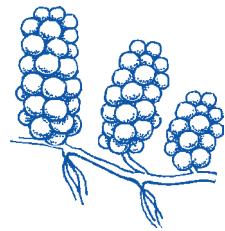


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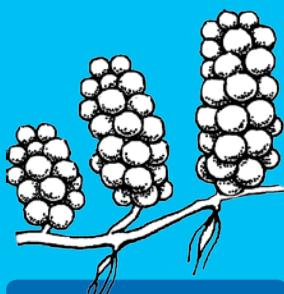


#23

# Ol si wid blong solwota we yumi save kakae olgeta



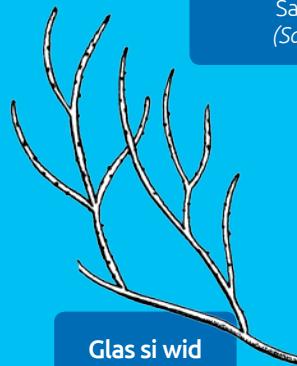
Braon si wid (smol lif)  
Sargassum  
(*Sargassum*)



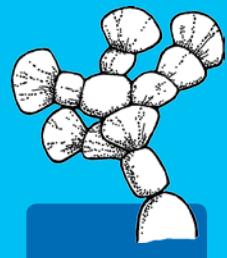
Si greps  
Sea grapes  
(*Caulerpa*)



Red alki  
Maidenhair  
(*Hypnea*)



Glas si wid  
glass weed  
(*Gracilaria*)



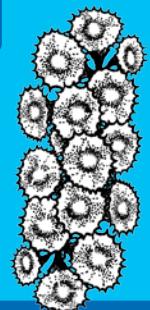
Grin si alki  
(*Halimeda*)



Grin si wid  
(*Euchema*)



Fanel si wid  
Funnel weed  
(*Padina*)



Paenapol si wid  
Spiny top  
(*Turbinaria*)



## Spisis mo distribiusen

I kat ova long 500 kaen si wid blong solwota raon long ol aelan blong Pasifik mo maet 20 pesen blong olgeta oli yusum olsem kakae. I kat sam nomo we yumi tokbaot long ples ia be yu save faenem infomesen long ol narawan long SPC web saet ([www.spc.int](http://www.spc.int))<sup>1</sup>

Long kastom blong yumi, yumi bin yusum ol si wid blong solwota olsem kakae blong ol man mo ol animol we yumi stap lukaotem olgeta, olsem meresin, mo olsem mulch mo fetalaesa long garen. Evri plant we oli soem antap, wetem *halomida* we hemi wan plant we i gat wan impoten rol blong fomem ol sanbij – oli yusum olsem kakae or blong putum tes mo fleva long kakae. Totel gras, glass weed mo maidenhair oli yusum plante olsem kakae, mo tu ol strong plant olsem *sargassum* mo funnel weed oli yusum blong mekem lifti mo supsup long hem.

Sam long ol spisis we oli no ol stret plant blong solwota blong Pasifik oli karem blong introdiousim long Pasifik. *Eucheuma* mo *Kappaphycus* (we i olsem famli blong *Eucheuma*) oli karem mo introdiousim long Pasifik mo oli famem long sam ples blong karemaot carrageen, we oli yusum blong mekem sam samting olsem tutpes mo aeskrim i kam tik. Wan spisis blong maidenhair (hooked red seaweed, *hypnea musciformis*) we i no blong Pasifik oli introdiousim long Kane'ohe Bay long 1974 blong famem mo i spred kwiktaem truao long Hawaii. I gat sam nara si wid we maet oli save famem olgeta.



## Ples we ol si wid i stap long hem mo kakae blong olgeta

*Eucheuma*, spisis we i stap long pikja antap, i stap long plante ples long ol aelan long Pasifik. Sam, olsem maidenhair mo glass weed, i stap long ples we i save haed behaen long rif eria mo ol narawan olsem totel gras oli stap laef long eria we i gat plante muvmen blong wota.

Ol si wid blong solwota oli no olsem ol plant blong graon we oli karem nutrien long graon tru long ol rus blong olgeta, olgeta oli tekem nutrien (kakae) aot long solwota we i stap raon long hem. Sam braon kala si wid olsem *Sargassum* oli gru kwiktaem long taem we i gat plante nutrien long solwota long ol eria long kos, plante taem long wet sison, mo oli gru antap mo kilim ol korel. Hemia i kam wan problem espeseli long taem we ol animol blong solwota we oli stap kakae ol si wid (si ejen, si snel mo ol fis olsem piko we oli stap kakae ol plant) oli ovafism olgeta.



<sup>1</sup> Irene Novaczek (2001) A guide to the common edible and medicinal seaweeds of the Pacific islands. Community Fisheries Training Pacific Series 3A. Supplementary Guide to Seaweeds: Pacific Series 3. USP Marine Studies Programme / SPC Coastal Fisheries Programme.



#23

# Ol si wid blong solwota we yumi save kakae olgeta



## Riprodaksen mo saekol blong laef

Ol defren spisis blong si wid oli gat ol defren fasin blong riprodaksen mo plante taem oli kompliketed tumas.

Long wan kaen isi fasin blong riprodaksen (we oli kolem asexual reproduction) sam pis blong plant ia i brok aot long bigfala plant mo oli gru i kam wan niu plant. Sam spisis oli brok long taem we solwota i raf long ol hariken mo oli flos i go long wan long distens bifo oli setel long wan ples mo gru. Evri niu plant we i gru olsem oli ol clone - minim se hemi sem mak long ol nara wan we oli bin brok aot mo hemi sem mak long si wid we i peren blong hem.

Ol si wid blong solwota i save riprodius wetem tufala seks taem oli prodiusim ol man mo woman plant we oli kolem gametophytes we oli givim aot ol eg mo sperm igo long solwota. Afta we eg i fetalaes igo long solwota i gru blong kam wan niu si wid.

Ol si wid ia i save gru kwiktaem – taem ol kondisen i gud, sam totel gras oli save gru 2 sentimita long wan dei. Sam si wid oli annual, minim se oli laef mo ded bakegen insaed long wan yia, sam nara wan oli save laef go kasem 10 yia.



## Fasin blong karem ol si wid blong solwota

Long ol aelan blong Pasifik, koleksen mo mekem maket long ol si wid blong kakae hemi stap involvem ol woman mo famli mo viley grup. Long sam kalja, wan ples blong havestem oli yusum longtaem finis mo i kam wan ples we oli kipim hem olsem i wan sikret.

From oli stap laef long ol salo wota, ol si wid we man i save kakae oli impoten tumas olsem wan saplae blong kakae espeseli long taem we solwota i raf. Si wid hemi gat gudfala faeba blong kakae, smol fat nomo mo plante kaen vitamin mo mineral.



## Fasin blong manejmen we yu save jusum

I no gat eni nasonal manejmen kontrol we oli putum long koleksen blong si wid blong solwota long ol aelan kaontri blong Pasifik mo manejmen hemi stap long han blong fising komiuniti nomo. Ol aksen we komiuniti i save jusum i inkludim:

→ Livim o plantem bakegen pat blong wanwan plant. Ol si wid olsem totel gras i save gru bakegen long ol smol pat blong plant sapos oli livim long ples we oli faenem o putum long ol krak long rif we i stap klosap. Ol viley miting mo wok sop i save enkarejem ol kolekta blong folem praktis ia. Long Fiji bifo, ol woman oli kolektem ol stamba we oli stanap nomo mo oli livim ol stamba we oli stap leitaon blong mekem ol niu plant.

→ Setemap rotesonal haves. Wan komiuniti fising eria i save divaed igo long sam smolsmol eria. Sapos i kat tri eria, olsem eksampol, koleksen blong si wid long wan eria i save stap blong tu manis blong alaoem plan blong i gru gud. Koleksen blong si wid i save gohed long nara tu eria long taem ia. Wanwan eria i klos blong tu manis.

Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmannetwork.org](http://www.lmannetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker



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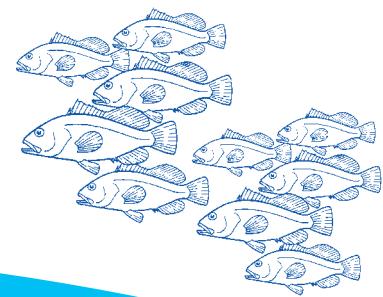
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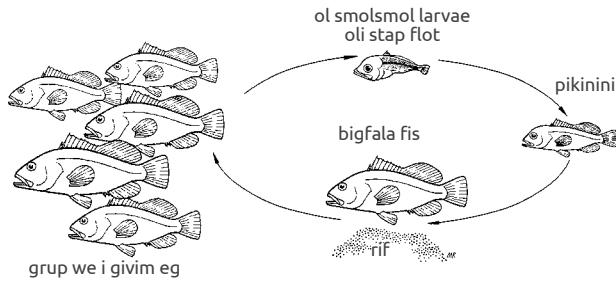
#24

# Spawning aggregations



## Wanem nao hemi spawning aggregation?

Wan fis spawning aggregation hemi wan bigfala namba blong ol fis we oli grup tugeta long wan ples mo long wan taem blong spawn mo prodiusim mo fetalaesem eg. Ol eg ia bae oli brok mo ol smolsmol larvae oli kamaot. Oli gru ikam ol pikinini blong fis mo afta oli gru i kam ol bigfala fis we oli save mekem pikinini. From spawning agregesen i tekem ples evri yia long sem taem, long sem ples, i mekem se yu save talem nomo wanem taem o ples nao bae i tekem ples.



## Wanem kaen spisis oli stap kam tugeta blong spawn long grup?

Plante spisis oli kam tugeta blong fomem spawning agregesen o muv long bigfala namba blong go long ples blong spawn. Long aelan kaontri blong Pasifik, ol grup ia i inkludim ol los, malet, blufis, karong, poketnaef fis, piko, redmaot, mustas fis mo manggru.

Plante fis we oli stap fomem spawning grup oli stap laef long ol nara eria long ol defren stej blong laef saekol blong olgeta. Ol stej blong eg mo larvae blong plante fis, blong tekem wam eksapol, oli drif o flot bitim rif bifo oli muv igo long salo wota mo setel long rif blong gru ikam wan big fis. Spawning grup oli stap tugeta blong wan sot taem nomo, olsem 2 go kasem 27 dei, long taem blong niumun o fulmun





#24

# Spawning aggregation

## From wanem ol fis oli stap kam tugeta long grup blong spawn?

Oli tingting se impoten rison from wanem plante defren fis oli kam grup tugeta blong spawn hemi blong inkrisim janis blong riprodaksen blong kam wan sakeses. Plante animol long solwota, inkludim 96% blong ol fis, oli riprodius aotsaed long bodi blong olgeta taem we oli rilisim sperm mo eg blong olgeta i go long wota.

No mata we ol man mo woman fis oli seraot ova long ol bigfala eria, ol spawning agregesen i alaoem olgeta blong kam grup tugeta long wan ples. Taem plante plante man mo woman fis i kam wan ples i save alaoem olgeta blong resis blong faenem patna mo blong jusum patna, mo hemi inkrisim janis blong sperm i kasem mo fetalaesem ol eg we oli stap flot.

Narafala rison maet i from spawning ples oli stap long ol ples we taed i save karem ol smolsmol larvae igo long open si we ol animol blong so oli no save kakae olgeta. O maet spawning ples oli stap long ples we taed i save karem ol smolsmol larvae i gobak long peren populesen long ol rif we ol fis we oli grup tugeta oli kamaot long hem.

## Wanem kaen denja ol spisis we oli agreget oli fesem?

Long klosap evri spisis, i mas gat spawning agregesen blong ol spisis ia blong save mekem pikinini, mo long eni wanwan eria, namba blong agregesen blong wan spisis i fui minim se evri wanwan blong ol agregesen hemi impoten. Taem fis i agreget o kam tugeta long wan ples long bigfala namba long ol taem mo ples we ol fis i save long hem, oli mo isi blong oli kasem olgeta bitim taem we oli stap wanwan olbaot long ol bigfala eria. Ol fis i faenem se i isi tumas blong kasem ol fis we i agreget wetem net, hanlaen wetem huk, spia o trap.

Blong kasem ol fis taem oli kam tugeta long ol spawning grup i wan nogud fasin nating from ol fis ia we oli stap kam tugeta blong mekem pikinini oli responsibol blong prodiusim ol smolsmol fis, we plante long olgeta i save gru mo stap rere blong oli kasem olgeta long fiuja. Long plante pat blong wol, taem oli fising long ol spawning grup hemi minim se sam spisis oli lusum olgeta finis long ol lokol eria.



## Hao nao yumi i save manejem mo protektem ol spisis taem oli agreget?

Blong manejem ol fiseris we oli bes long ol kaen fis we oli fomem ol spawning grup hemi dipen bigwan long fising komiuniti we hemi mas plem wan big pat long hem. Hemia i from ol lokol fisa plante taem oli save wiswan spisis oli mekem ol spawning agregesen mo oli save ol taem mo ples we oli stap kam tugeta blong spawn.

Fas step hemi blong holem ol miting blong komiuniti blong mekem sua se evriwan i save gudwan se ol spawning grup oli impoten tumas blong provaedem ol fis long wan sastenebol fasin. Olgeta lokol fisa i mas stap long ol miting ia from olgeta oli mas aidentifaem ol ples we ol fis i grup tugeta mo long wanem taem, blong mekem se komiuniti i save manejem spisis ia gud.

Sam ofisa blong fiseris o sam NGO maet olgeta oli involv blong fasilitetem ol miting ia mo blong provaedem ol teknikol save, be maet ol lokol fisa i no wantem talemaot long fored blong olgeta long wea ples ol spawning ples i stap long hem. Ol visita ia oli mas rispekte wanem ol memba blong komiuniti i wantem, sapos oli wantem kipim ol infomesen ia blong olgeta nomo.

Ol miting blong komiuniti oli save provaedem ansa long ol kwestin olsem:

- **Wiswan spisis i fomem spawning agregesen? Oli mas mekemap tingting blong olgeta long wiswan spisis oli mas protektem fastaem from i stap long bigfala denja.**
- **oli save wanem long saed blong laef saekol blong olgeta spisis ia?**
- **long wiswan ples ol fis i stap grup tugeta – i gat hamas difren ples blong spawn?**
- **long wanem taem ol fis oli stap grup tugeta olsem? – long sem taem long evri yia? – long wanem taem blong mun (fulmun, niumun)?**
- **spawning agregesen hemi gohed long hamas dei?**
- **wanem kaen manejem mesa maet oli tekem?**
- **hao nao oli save mekem sua se ol pipol oli folet ol mesa ia?**

Namba tu step hemi blong developem wan plan blong manejem ol spisis we oli agreget. Mos impoten aksen blong tekem hemi blong banem, sapos no katemaon, praktis blong kasem fis long taem we oli muv igo long agregesen ples mo long taem we oli stap tugeta finis long ples ia. Maet hemi minim se oli mas stopem o katem daon fising long wan stret taem long wanwan long ol ples ia.

Sapos komiuniti i no save agri long wan totol ban blong no kasem ol spawning fis, maet oli disaed blong yusum wan nara mesa, we i no gud tumas komperem wetem ban, hemi blong ristrikit yus blong ol fasin blong fis we i katem daon namba blong fis kwiktaem, maet oli save banem ol net, spia mo trap, be gohed blong alaoem smol namba blong fisa blong yusum ol laen mo huk wetem bet.

I gud tumas sapos fasin blong protektem ol fis taem oli stap go tugeta long spawning agregesen i save kam wan pat nomo blong wan bigfala manejem plan we i inkludim proteksen blong ol stej blong laef saekol blong fis, mo protekten blong ples we oli stap laef long hem. Blong tekem wan eksampol, maet i gud blong putum mo enfosem ol minimam saes limit blong letem ol smolsmol fis i gru go kasem saes we oli save agreget mo mekem pikinini. Ol manejem aksen blong wanwan spisis oli tokbaot long ol nara pepa blong toksave blong SPC.

Proteksen blong ples we ol fis i stap laef long hem hemi wan impoten pat blong eni manejem plan. Sapos komiuniti i setemap mo manejem ol tabu eria mo ol fis resev, maet aksen ia i protektem sam ples we ol fis i dipen long olgeta mo maet i inkludim spawning eria blong sam spisis.

Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmannetwork.org](http://www.lmannetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejem joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, you save luk long gaed buk. Foto : Mathieu Juncker



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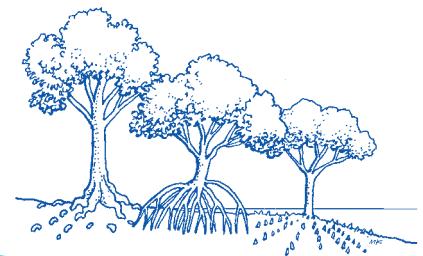
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#25

# Natongtong

## Mangroves

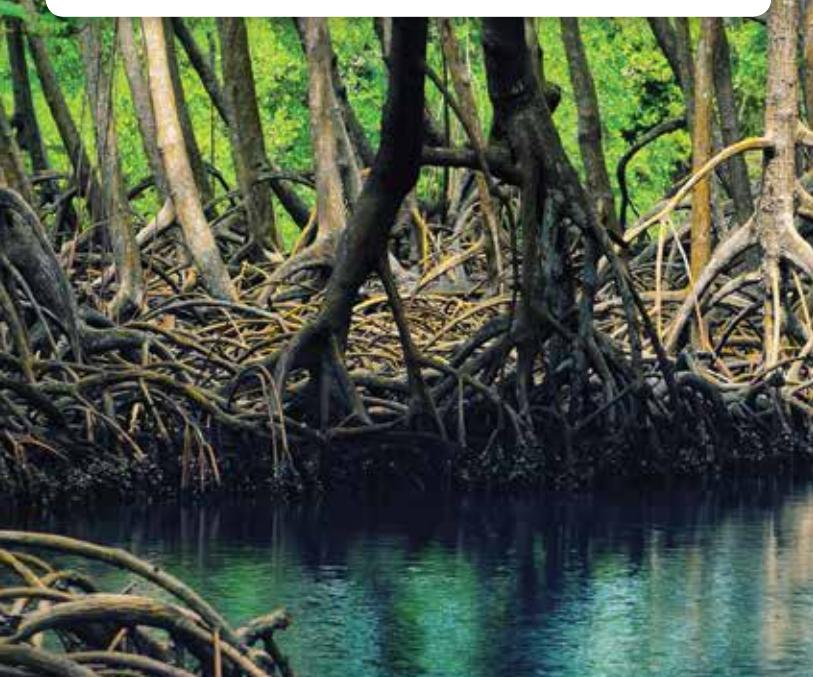
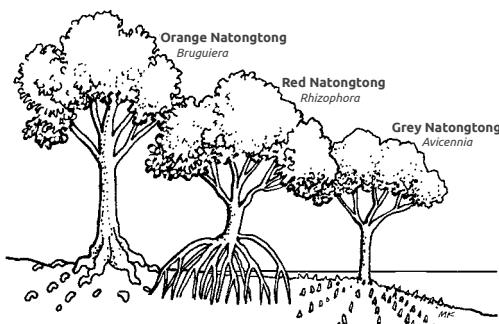


### Ol natongtong i wanem?

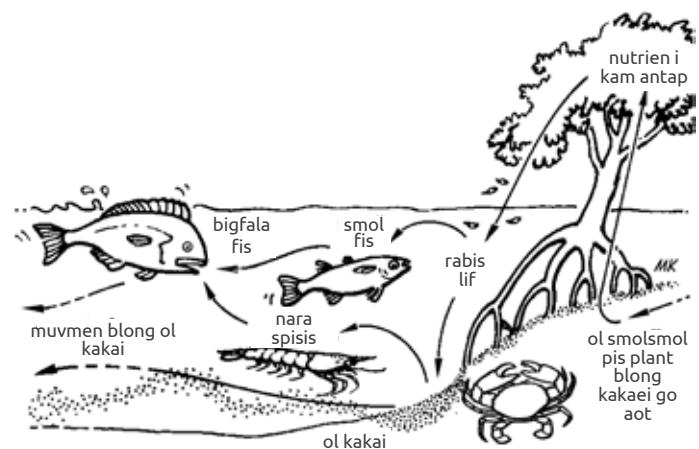
Aot long plante taosen defren spisis blong ol tri long wol, abaat 80 nomo i save stap laef wetem rus blong olgeta insaed long wota we i gat sol long hem. Ol tri, we oli speselaes be we plante long olgeta oli no famli, we oli stap laef long ej blong solwota, yumi save olgeta olsem natongtong.

Taem ol tri ia oli bin stap gru longtaem long graon we ol smol pis samting i stap flos long hem (silt) mo hemi fulap wota, plante long olgeta oli bin divelopem ol rus we i stap aot long graon (aerial root) we i save tekem oxygen i kam insaed long tri mo sem taem sapotem hem. Long pikja antap, orange mangrove hemi gat ol rus (knee roots) we oli stik aot long silt, red mangrove hemi gat ol longfala rus (prop roots) we oli gru daon long stampa blong tri, mo grey mangrove hemi gat ol rus (cable roots) we oli sendemap ol smolsmol rus olsem smol stik (pneumatophores).

Namba blong ol spisis blong natongtong hemi go daon stat long wes go kasem is ova long Pasifik. I gat 33 defren spisis long Papua Niugini, 24 long Solomon Aelan, 7 long Fiji mo 3 long Samoa. I gat 23 spisis we i konfem long Vanuatu. I no gat eni natongtong taem yu go long is, long ol kaontri olsem Cook Aelan, be sam oli bin introdusim long Hawaii mo maet long Tahiti.



### From wanem ol natongtong oli impoten?



Sapos yu luk long pikja antap, ol niutrien we oli disolv long wota we i stap ran aot long graon ol natongtong oli tekem mo yusum olgeta. Long wanwan yia wan hekta blong natongtong hemi save prodiusim ova long 16 tonne blong lif we i foldaon mo roten blong kam detritus – ol smol pis plant mata we oli provaedem kakae blong plante animol inkludim ol wom, krab mo sam kaen fis. Ol hol blong ol krab we oli stap andanit long sofmad oli letem wota wetem oxygen blong hem i go dip insaed long ol mad flat. Plante bigfala fis oli kakae ol smolsmol animol ia.

Ol natongtong oli impoten tumas olsem neseri eria – ol eria we yang blong plante spisis blong solwota oli save gru long ol sef ples wetem plante kakae. Ol kakae we oli kamaot long eria blong natongtong ol taed mo ol fis we oli stap muv aot long eria ia oli tekem olgeta i go long ol sistem we oli stap daonstrim mo long ofso.

Ol rus blong ol natongtong we oli no stap andanit long wota oli kasem ol smol pis lif mo sedimen (sediment - ol smol samting we oli setel long botom blong solwota) we oli bildemap sloslo mo ekstendem so laen. Taem laen blong ol natongtong hemi muv igo fowod sloslo long solwota, ol niu land binaen long olgeta ol nara plant oli kam blong stap gru long hem. Ol natongtong oli save kasem guawan ol stiki grup blong sedimen we i miks wetem ol niutrien (nem blong olgeta flocs) we olgeta i save kavremap ol smol korel.

Wan nara samting we ol natongtong i mekem, hemia i blong protektem graon from si level raes mo tu from ol hariken mo saeklon we oli ting se bae oli kam mo strong wetem global warming.



#25

# Natongtong

## Hao nao ol natongtong oli riprodius mo spred?

Ol bebet (insects) mo ol pijin we oli laekem tumas ol flaoa blong sam long ol natongtong oli tekem paoda aot long man pat blong riprodaksen igo long woman pat; sam nara tri maet win i polinetem olgeta (tekem paoda aot long wan flaoa i go long nara flaoa maet long wan nara tri). Taem ol sid i stap yet long tri, ol sid ia oli stap gru blong stat blong mekem smol plant (seedling), nem blong olgeta propagules, we oli stap foldaon long solwota. Olgeta ia oli flot igo mo olgeta we oli setel long salo wota we i stret long olgeta oli stap stanap stret mo putum aot ol rus rere blong gru i kam wan niu tri.

## From wanem ol natongtong oli stat blong lus?

Haf blong ol natongtong long wol oli bin lus long las handred yia we i pas. Long ol aelan blong Pasifi oli yusum ol natongtong olsem wud blong faea mo blong bildim haos wetem. Be mos long ol natongtong oli kilim olgeta taem oli aotem olgeta blong yusum graon we oli stap long hem mo from kwaliti blong wota i stap jenis.

Taem oli bildim ol rod long kos, solwota we i kam antap wetem taed i no save gohed blong miksim wetem fres wota we i gat plante niutrien long hem we hemi kamaot long graon. Hemia i minim se plante natongtong oli lus. Ol ples we oli sakem doti long ol eria blong natongtong oli givimaot oel mo aean (wanem oli kolem heavy metal) igo long solwota; ol skin blong oel oli kavremap ol rus blong ol natongtong minim se oli no save tekem oxygen i go insaed long olgeta mo ol heavy metal ia oli katemdaon fasin we ol plant i yusum blong mekem kakae blong olgeta tru long ol lif (we oli kolem photosynthesis).



## Long wiswan fasin nao yumi save manejem mo protektem ol natongtong?

Blong protektem ol eria blong natongtong we oli stap yet, ol gavman i mas limitim developmen we i gohed long ol koslaen mo katemdaon polusen – oli mas mekem olsem:

- Mekem ol regulesen blong blokem ol man blong no tekemaot o damejem ol natongtong we i stap yet mo mekem sua se olgeta i folet ol regulesen ia.
- Mekem sua se oli katemdaon polusen we i kamaot long ol ples blong doti, ol fam mo ol industri.
- Askem wan environmental impact assessment (EIA) long evri niu developmen blong mekem sua se oli no spoelem ol eria blong kos.
- Mekem sua se oli putum ol bigfala paep o tanel anda long ol rod long kos blong alaoem solwota blong miks wetem fres wota we i ran aot long graon.
- Kriitem ol buffer zone (ol ples we oli no save yusum olgeta) bitwin long ol developmen long kos mo ol eria blong natongtong.

Ol komiuniti we oli stap long kos oli save protektem ol natongtong sapos oli inkludim olgeta insaed long ol Marine Protected Area (ol MPA, ol eria blong solwota we oli protektem olgeta) we komiuniti i stap manejem. No mata we wok blong protektem ol natongtong we oli stap yet hemi impoten tumas, maet oli traem planem ol smols-mol natongtong blong traem putum i gobak bakegen wan eria blong natongtong. Be fastaem oli mas askem ol kwestin ia bifo oli tingbaot blong putum i gobak wan eria blong natongtong:

- From wanem i no gat eni natongtong long eria ia nao ia? Eria ia i no stret blong ol natongtong i gru long hem? Ol taed mo wef i strong tumas? Sapos i olsem, ol sidling blong natongtong oli no save gru.
- Sapos i gat ol natongtong long eria ia bifo, from wanem oli lus? Oli bin tekemaot olgeta taem oli klinim graon ia? Sapos i no olsem, from wanem nao oli ded? Oli save impruvum ol kondisen?
- From wanem eria hemi no kavremap bakegen wetem sidling blong natongtong we i flot i go long eria ia? Ol taed oli no help o oli jenesim daereksem? O ol nara kondisen oli no stret blong ol natongtong i gru?

Maet i gat nid blong risivim apruvol blong lokol gavman blong gohed blong planem ol sidling blong natongtong. Askem advaes long ol lokol otoriti, ol NGO o oganaesesen blong Rijon.

Sapos ol komiuniti oli invaetem ol turis blong pem wan fi blong go long kenu o wokbaot long ol timba we oli putum antap long sof graon blong luk ol natongtong, maet fi ia i save helpem komiuniti blong protektem ol natongtong mo blong planem olgeta bakegen.



Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmannetwork.org](http://www.lmannetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejem joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker



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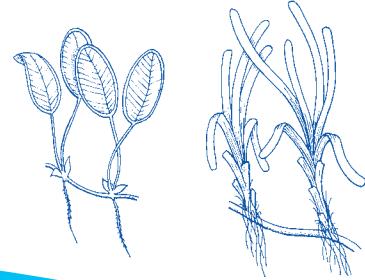
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#26

# Si gras

## Seagrass



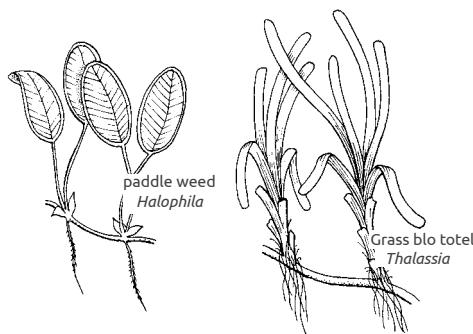
### Ol si gras i wanem?

Ol si gras i famli blong ol plant we i gat flaoa we i stap long aelan, be long wan taem samples 50 go kasem 100 milian yia we i pas finis oli muv i go long solwota. Bifo long taem ia, i gat wan kaen plant nomo long solwota, hemia i ol nalullum blong solwota.

Ol si gras oli no ol stret gras olsem i stap long graon, be strakja blong olgeta i sem mak lelebet. Oli gat ol lif we i kamaot long wan sot stem we i stap stanap mo ol stem we oli krip long graon (rhizomes). Ol si gras oli tekem kakae blong olgeta tru long ol rus olsem ol gras blong graon, i no aot long wota olsem ol si wid blong solwota.

Ol lif blong plante long ol spisis i longfala mo olsem gras be long wan kaen spisis we pikja blong hem i stap antap long lef saed oli olsem ol padel we oli waed smol.

Long wes blong Pasifik Osen i gat 13 aot long 60 spisis blong si gras we i stap long wol. From ol si gras oli nidim se laet blong san i mas stap strong oli gru long wota we i salo – plante taem daon long ples we solwota i drea long ol rif flat mo ol lagun we oli gat san long botom blong olgeta mo bitwin long ples blong fultaed mo ples we solwota i drea long ol ples we i gat sofmad long olgeta.



### Ol si gras hao nao oli riprodius mo spred?

Ol si gras oli gat ol smol flaoa we oli fetalaes wetem paoda we taed blong solwota i karem olgeta, i no sem mak we bebet, o pijin o win i karem paoda blong ol plant long aelan. Bakegen, ol pis blong si gras i save brok aot long ol bigfala plant mo flot i go mo gru long ol nara ples we i stret long olgeta. Be long wan nara fasin, ol si gras oli save spred kwiktaem from ol stem we i krip i gru; oli save sendemaot ol niu sut blong mekem ol bigfala bed we i olsem ol ples we gras i gru long hem blong givim kakae long ol buluk, be oli stap anda long wota.

### From wanem ol si gras oli impoten?

Ol si gras oli provaedem kakae mo ples blong haed blong plante difren kaen animol blong solwota. Ol grin totel, ol kaofis, sam kaen fis mo si ejen oli kakae si gras. Mo plante mo spisis oli stap kakae ol si wid we ol lif blong olgeta i bunbun olsem hea (epiphytes) we oli stap gru long ol lif blong si gras. Long en blong laef blong olgeta ol lif oli go rotен mo fomem detritus - ol smolsmol pis plant we oli provaedem kakae blong plante mo spisis blong solwota.

Ol si gras oli tekem igo insaed long olgeta kakae blong olgeta tru long ol rus blong olgeta mo yusum bakegen ol mata we maet hemi gohed blong stap fas anda long ol plant sapos si gras i no yusum olgeta. Ol si gras i provaedem plante kakae, sem taem oli provaedem wan neseri eria we ol yangfala blong plante spisis blong solwota i save laef long hem mo gru bifo oli muvaot blong stap long wan nara ples taem oli kam big.

Ol bed blong si gras oli holemaet long ol smol pis mata we sapos oli no holem olgeta oli save go setel antap long korel mo save kilim hem i ded. Taem oli mekem olsem semtaem oli ekstendem laen blong so mo protektem kos long aksen blong ol wef mo erosen.

Si gras i yusum carbon dioxide ( $CO_2$ ) we i disolv long solwota mo sem taem maet si gras i help blong katemdaon ocean acidification (hemia i minim fasin we solwota i save tekemap tumas carbon dioxide aot long ea, we sam long hem i wok wetem solwota blong mekem carbonic acid). Taem solwota i gat tumas acid long hem, i save spoelem korel mo ol nara samting blong solwota we oli bes long calcium carbonate, olsem ol sel). Oli ting se ol si gras oli holemaet samting olsem 15% blong carbon we i stap long solwota.





#26

# Si gras

## From wanem ol si gras i stap lus?

Klosap 30% blong ol bed blong si gras raon long wol oli bin lus stat long taem we oli kipim ol rikod. Taem ol dvelopmen long kos oli mekem wota i no mo klia mo ol niutrien we i ran aot long ol haos mo fam, wetem ol graon we ol bed blong si gras i stap long hem we oli tekem bakegen blong yusum, i mekem se plante bed blong si gras i lus long plante aelan kaontri blong Pasifik.

Taem oli bildim plante haos klosap long kos mo oli dvelopem ol pot, olgeta aktiviti ia i prodiusim plante silt (ol smolsmol pis samting we i save flot long wota mo go daon blong stap long botom). Samting ia i blokem laet mo samtaem hemi kavremap si gras go kasem hemi ded. Long sam ples, taem oli tekemaot ol natongtong, silt nao hemi go blong afektem ol si gras bed we i stap klosap.

Niutrien aot long ol septik tang mo fetelaesa i mekem namba blong ol smolsmol plant we oli flot (phytoplankton) i go antap, we hemi katemdaon hamas laet blong san i save kasem ol si gras. Long sem taem, ol niutrien i minim se namba blong ol smolsmol si wid i save kavremap ol si gras, we bakegen olgeta tu i save blokem laet blong san.

Klaemet jenis tu maet hemi afektem distribiussen blong ol si gras. Taem solwota i go antap, maet i gat mo eria blong wota we i salo mo ol si gras i save spred mo laef long hem.

Long Caribbean (ol aelan long West Indies klosap long Sentrol Amerika) plante ful bed blong si gras oli lus from populesen blong ol spisis olsem ol si ejen oli kam bigwan tumas kwiktaem mo oli kakae evri si gras. Ol si ejen namba blong olgeta i kam bigwan from olgeta fis we i kakae olgeta, ol sanpepa fis, oli fisa oli kasem tumas long olgeta, minim se oli no stap blong kakae ol si ejen.



Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmannetwork.org](http://www.lmannetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, you save luk long gaed buk. Foto : Mathieu Juncker



## Hao nao yumi save manejem mo protektem ol si gras?

Blong protektem ol bed blong si gras, i mas gat aksen blong gavman blong manejem ol eria blong kos. Be i gat sam aksen we ol komiuniti we i stap long kos i save tekem:

### → Lukluk gud long kwaliti blong wota mo saes blong ol bed blong si gras

Ol otoriti blong gavman long saed blong envaeromen oli mas lukluk gud evri taem (monitor) kwaliti blong wota long ol impoten ples raon long kos, mo luk espeseli long ol ples we i gat tumas silt mo niutrien. Oli sud mekem ol map fastaem blong ol bed blong si gras, wetem help blong ol lokol komiuniti; long wei ia i mo isi blong jekem sapos i gat eni jenis long ples we ol bed i stap long hem.

### → Mekem ol pipol i luksave impotens blong si gras mo ol denja we oli fesem

No mata we ol bed blong si gras oli impoten tumas blong provaedem ol ples blong ol fis i stap laev long olgeta mo protektem ol kos, pablik i no recognaesem se olgeta i impoten olsem natongtong mo ol korel rif. I gat nid blong mekem plante program blong eduketem pablik long impotens blong si gras bed mo blong aidentifaem wanem ol komiuniti i save mekem blong protektem olgeta.

### → Katemdaon ol niutrien mo nara samting we i polutim ol wota long kos

Oli save katemdaon ol sedimen mo niutrien we oli ran aot long graon igo long wota long kos sapos oli plantem ol smol mo big tri long bang blong ol riva mo lukaotem gudwan ol natongtong long so.

Oli mas yusum ol sastenebol praktis long saed blong agrikalja blong katemdaon erosion mo problem blong fetelaesa mo sitsit blong ol animol we i ran i go long wota. Oli no mas kipim ol animol blong fam i stap long ol ples we sitsit blong olgeta i save go insaed long ol riva we wota blong olgeta i go kasem solwota.

### → Kontrolem dvelopmen long kos

Gavman i mas askem wan environmental impact assessment (EIA) blong olgeta niu dvelopmen blong mekem sua i gat smol distebens nomo long ol eria blong kos. Ol eria blong bus, tri mo plant blong kos, espeseli ol natongtong, oli mas stap mo ol komiuniti i mas lukaotem olgeta raon long ol riva mo long ol kos.

### → Protektem ol eria blong si gras

I gat plante tumas spisis blong fis we oli yusum ol bed blong si gras blong haed long olgeta mo faenem kakae blong olgeta taem oli smol, bifo oli muv igo long ol rif taem oli kam bigfala. Sam spisis we i impoten tumas long saed long komes, olsem ol si-kukamba, oli dipen bigwan long bed blong si gras taem oli pikinini. Taem wan komiuniti i setemap olgeta marine proteted eria (MPA) i gud sapos oli inkludim ol bed blong si gras mo ol eria blong rif insaed long olgeta, blong letem plante spisis i komplitim saekol blong laef blong olgeta.

### → Ristiktim olgeta we oli stap fis blong no tekem tumas long ol spisis we oli kontrolem namba blong animol we oli stap kakae long si gras.

I wan gud tingting blong protektem ol spisis olsem ol sanpepa fis (trigger fish) we oli stap kontrolem ol animol olsem ol si ejen we oli stap kakae long si gras.

### → Putum ol si gras bed i go bak bakegen

Yu save mekem ol si gras bed i stap bakegen sapos yu tekem ol bigfala plant aot long ol helti bed long sem fasin we yu save mekem ol eria blong natongtong i stap gru bakegen. Be plante taem samting ia i nidim plante vatu mo i no bin gat tumas sakes long sam nara ples; i mo gud blong askem advaes long ol lokol otoriti mo olgeta long rijon.

Stampa tingting hemi blong impruvum ol kondison blong envaeromen, mo antap long ol nara samting, kwaliti blong wota. Sapos ol kondison i kam antap, maet i no gat nid blong plantem olgeta si gras bed bakegen.



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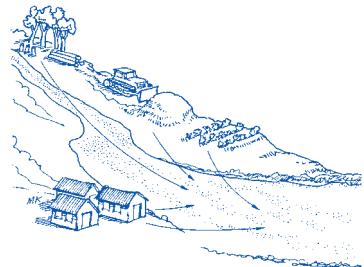


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#27

# Niutrien mo sedimen

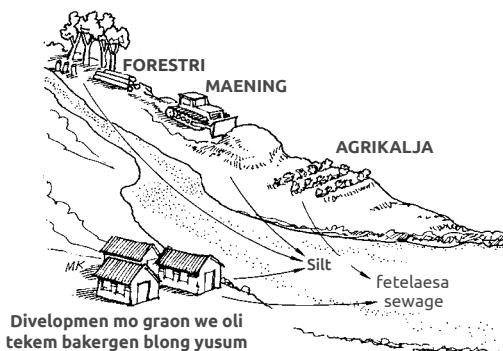


## Ol niutrien mo sedimen i wanem?

Wan niutrien hemi eni kaen samting we wan plant o animol i nidim hem blong kakae. Ol samting we i laef, ol plant mo ol animol, oli nidim niutrien. Taem yumi tokbaot ifek long olgeta samting long ol wota blong kos, yumi konsen bigwan wetem ol niutrien we oli disolv long wota i stap karem olgeta.

Silt hemi ol smolsmol samting we wota i sav karem olgeta: maet oli foldaon insaed long wota mo setel long botom blong solwota olsem ol sedimen.

Ol niutrien mo silt oli stap insaed long klosap evri wota blong kos mo ol problem i kam antap nomo taem i gat plante tumas long olgeta. Ren i wasem niutrien mo silt aot long graon igo long solwota mo ol riva, wan proses we plante taem oli kolem runoff.



## Ol niutrien mo sedimen oli kamaot long wea ples?

Klosap evri graon long ol aelan kaontri blong Pasifik hemi salo. Taem oli tekemaot ol tri mo bus mo klinim graon blong bildim haos o mekem fam, graon we i stap hemi no gat eni kaen proteksen. Ren hemi wasem ol smolsmol pis aot long graon olsem silt igo daon long hil igo long solwota. Silt i kamaot long plante ples olsem runoff, aot long graon we oli tekem i kambak (Reclamation), ol ples we oli mekem developmen, ol maen, agrikalja mo forestri.

Ol sitsit blong man wetem animol oli kolem hem sewage. Hemi gat insaed long hem ol bacteria o virus (olgeta bebet we i mekem ol plant, ol man o ol animol i sik) wetem ol niutrien. Sewage hemi go insaed long ol wota blong kos aot long ol fam, ol septik tang we oli fulap tumas mo ol sistem blong sewage we oli no stret.





#27

# Niutrien mo sedimen

## Wanem kaen problem ol bigfala kwantiti blong niutrien mo sedimen oli mekem?

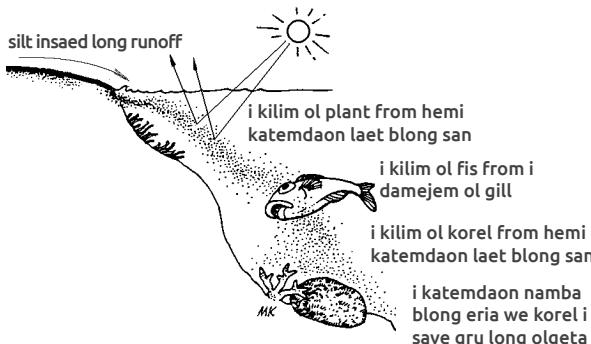
Niutrien mo sedimen oli mekem problem long plante long ol animol mo plant blong solwota, be bigfala problem hemi long ol korel rif. Hemia i from korel rif oli save gru nomo sapos wota i klia mo hemi no gat sedimen long hem. Ol smolsmol plant, we nem blong olgeta i zooxanthellae, we oli stap laef insaed long mit blong ol korel, oli nidim laet blong san blong produsim kakae we oli serem wetem ol korel.

Silt hemi blokem laet blong san blong i no kasem ol korel, be sem taem hemi sidaon long bottom blong solwota olsem sedimen. Ol sedimen maet oli kavremap ol ples we oli strong, minim se oli no stret blong niu korel i save setel mo gru long hem. Taem i gat tumas silt long wota i save spoelem ol fis taem i katem ol gill blong olgeta.

Plante tumas niutrien, plante taem aot long ol fetelaesa mo sewage, oli mekem ol plant blong gru kwiktaem. Long sam lagun, si wid blong solwota maet oli gru kwiktaem bitim ol korel mo tekem ol ples we maet ol niu korel oli save gru long olgeta. Ol smolsmol plant (nem blong olgeta epiphytes) oli kavremap ol lif blong si gras mo laet blong san i no save kasem olgeta. Ol tik mat blong si wid ia maet oli gru ova long ol had korel mo sam bacteria aot long sewage maet i givim wan sik long korel we nem blong hem i White Band Disease.

Taem ol bigfala kwantiti blong ol plant oli ded mo oli stap roten, ol bebet, nem blong olgeta bacteria, oli yusum ol oxygen we i disolv long wota. Ifek ia, we nem blong hem i eutrophication, maet hemi kilim i ded plante long ol spisis blong solwota, inkludim fis.

Ol bigfala kwantiti blong ol niutrien maet oli alaoem namba blong ol smolsmol plant we oli stap float (phytoplankton) blong kam bigwan long ol grup we oli kolem blooms. Sam long olgeta bloom, we nem blong olgeta i harmful algal blooms (o HABs) oli denjares long laef blong solwota mo long ol man tu, mo olgeta oli inkludim kaen ia we hemi responsibol blong posen fis we nem blong hem i ciguatera.



Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmannetwork.org](http://www.lmannetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, we save luk long gaed buk. Foto : Mathieu Juncker



## Hao nao yumi save kontrolem ol niutrien mo sedimen long ol wota blong kos?

Taem oli no manejem gud yus blong graon hemi save mekem i gat tumas sedimen mo niutrien insaed long runoff mo ol wota blong kos. Namba wan ansa i blong ol otoriti blong gavman oli wok wetem ol fama, olgeta we oli mekem divelopmen, ol komiuniti we i stap long kos blong promotem ol yus blong graon we i sastenebol, long wan fasin we oli kolem Integrated Coastal Zone Management. Sam aksen we i posibil i inkludim:

### → Impruvum fasin blong aotem sewage

Rabis wota aot long ol ples blong tritim sewage mo wota we i kamoat long ol septik tang (ol tang anda long graon we ol bacteria i brekem daon sewage) oli no save alaoem olgeta blong go insaed long ol riva mo wota blong kos. Long sam ples, oli bin planem ol banana mo sam nara kaen kakae klosap long ol ples we rabis wota ia i kamaot; olgeta plant ia oli yusum ol niutrien bifo oli save kasem solwota.

### → Katedaon runoff long ol fam

Wota we i stap ron ova long ol fam plante taem hemi gat ol kemikol insaed long hem we oli blong kilim ol rabis gras mo animol mo tu i gat ol fetelaesa we oli gat niutrien long olgeta we nem blong olgeta i nitrogen mo phosphorus. I gud sapos oli planem ol plant mo ol kakae long ol eria we i flat raon long hil long wanem oli kolem contour farming (luk long pikja). Oli save planem raon long ol flat eria o step olgeta tri, blong katedaon denja blong erosion, land i glis mo wota i kam fulap wetem silt.

### → Putum wan ban blong no tekem sanbis aot long sanbis long so

Long sam aelan kaontri blong Pasifik oli tekemaot sanbis long ol so. Hemia i mekem laen blong so i brokblok (erosion) mo mekem ol laen blong silt i go insaed long wota blong kos.

### → Putum wan ban blong no tekem sanbis aot long sanbis long so

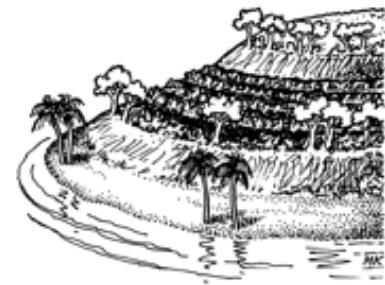
Long sam aelan kaontri blong Pasifik oli tekemaot sanbis long ol so. Hemia i mekem laen blong so i brokblok (erosion) mo mekem ol laen blong silt i go insaed long wota blong kos.

### → Protektem o planem ol laen blong tri klosap long ol riva mo graon klosap long so

Oli mas protektem ol tri we oli stap gru long graon we i klosap long so mo planem bakegen ol eria we i nomo gat ol tri. Ol najoral plant, olsem ol natongtong long ej blong solwota, oli no alaoem erosion mo oli blokem ol niutrien mo sedimen blong no kasem solwota.

### → Putum ol fanis blong stap smoltaem blong blokem sedimen raon long ol ples we oli stap bild long ol eria long kos

Taem oli stap bild long ol eria long kos o oli tekem graon i kambak (reclamation) oli sud putum ol fanis blong holem sedimen, olsem ol fanis waea we i gat ol smolsmol hol long hem we oli folet ol laen blong graon. Samtaem ol man oli bin yusum bel blong ol gras we i drae o ol suga ken stamba we i drae blong kasem silt bifo hemi go long solwota.



Contour farming, wan fasin blong fam we ol plant i stap long ol flat ples wetem tri long ej, hemi help blong blokem erosion, lan i glis mo wota i fulap wetem silt.



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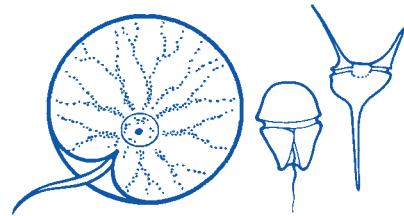
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#28

# Ol algae we oli save mekem problem

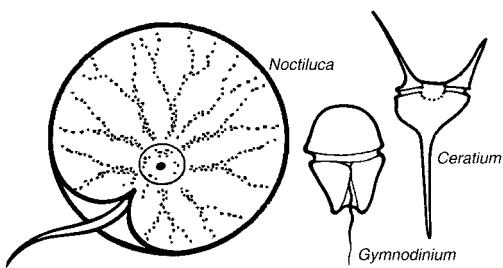
(Harmful algal blooms)



## Ol algal bloom, oli wanem?

Solwota, mo espeseli klosap long kos, i gat long hem plante smolsmol plant we oli stap flat we nem blong olgeta i phytoplankton (yu singaotem olsem: fae-tow-plank-ton). Pikja antap hemi soem sam eksampol blong wan impoten grup. Oli mekem ol pikja i kam bigwan we i bigwan, ol samting ia oli smol olgeta. Phytoplankton long lefhan saed, *Noctiluca*, hemi i bigwan bitim plante long olgeta, olsem 1 milimita. Plante taem hem nao i mekem ol smolsmol laet we yu save luk bihaen long yu taem yu stap long wan bot we i muv long naet.

Plante long ol smolsmol plant ia oli no save mekem problem mo oli impoten olsem kakae blong plante nara animol long solwota. Be samtaem ol namba blong olgeta i go antap bigwan kwiktaem mo yumi givim nem long samting ia algal bloom.



## Wanem nao i ol harmful algal bloom?

I gat sam fiu long ol phytoplankton we oli prodiusim ol strong posen mo taem namba blong olgeta i go antap oli talem se i wan harmful algal bloom o HAB.

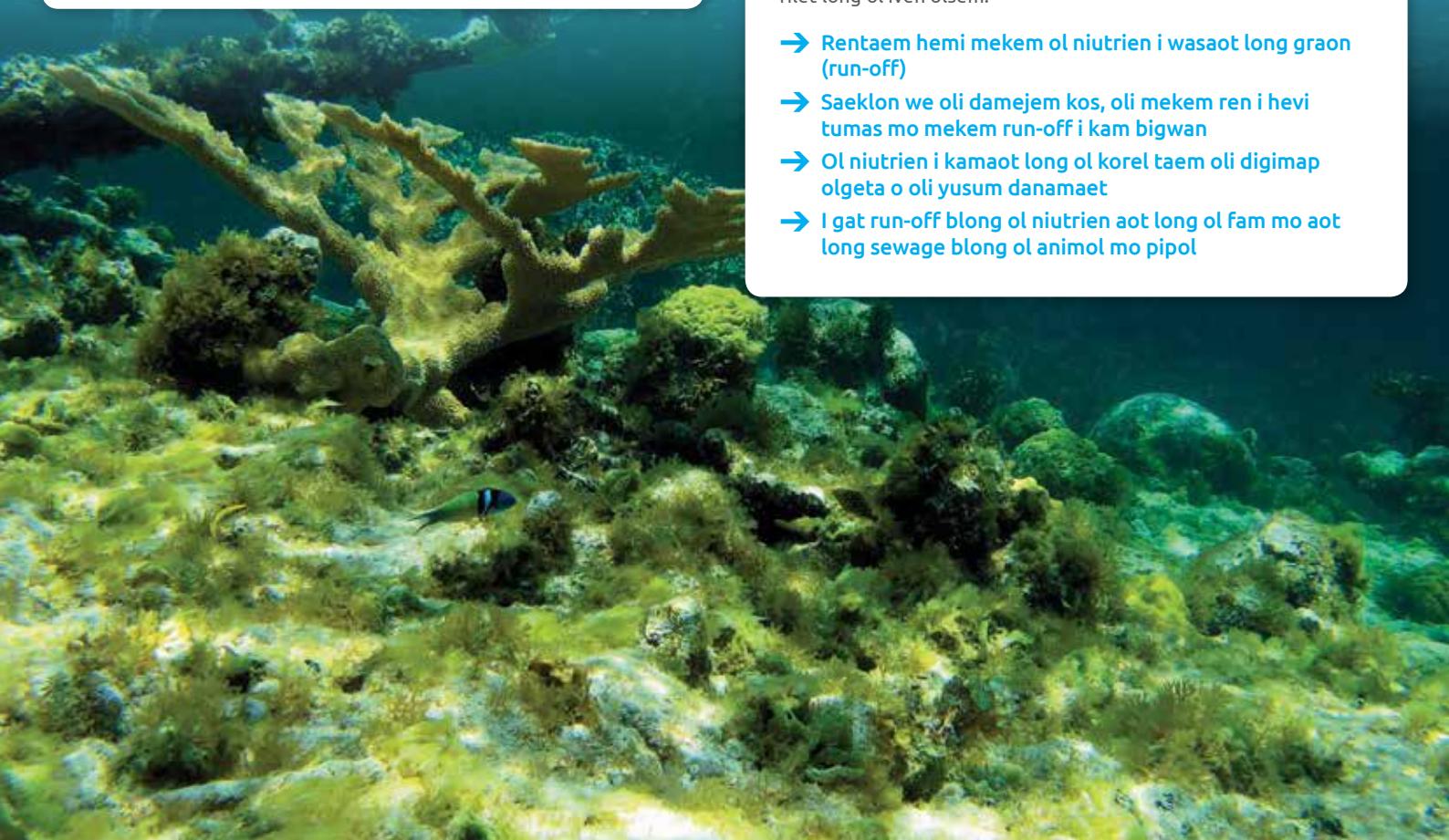
Memba blong grup long pikja antap (dinoflagellates) plante taem oli kam tugeta long ol harmful algal bloom we oli kilim ol fis mo selfis, maet long wan stret fasin o from oli prodiusim ol posen we i blokem ol gill, o from i katemdaon hamas oxygen i gat long wota.

## From wanem i gat ol harmful algal bloom?

Olsem ol nara plant, ol phytoplankton oli nidim laet blong san mo ol niutrien blong gru mo mekem namba blong olgeta i go antap – ol niutrien i ol kaen samting we ol animol mo plant oli nidim olsem kakae. Tufala niutrien we ol phytoplankton i mas gat nem blong tufala i nitrogen mo phosphorous, mo tufala i stap, be smolsmol nomo, long solwota.

Be samtaem ol niutrien long solwota blong kos oli go antap bigwan we i save mekem ol harmful algal bloom i kam antap. Long ol aelan kaontri blong Pasifik, maet hae kwantiti blong niutrien i rilet long ol iven olsem:

- Rentaem hemi mekem ol niutrien i wasaot long graon (run-off)
- Saeklon we oli damejem kos, oli mekem ren i hevi tumas mo mekem run-off i kam bigwan
- Ol niutrien i kamaot long ol korel taem oli digimap olgeta o oli yusum danamaet
- I gat run-off blong ol niutrien aot long ol fam mo aot long sewage blong ol animol mo pipol





#28

# Ol algae we oli save mekem problem

## Wanem nao ol ifek blong ol harmful algal bloom?

HAB oli save givim sam kaen sik long ol pipol. Ol selfis olsem natalae, masel mo oista oli tekem sam long ol posen phytoplankton olsem kakae aot long solwota we i pas tru long olgeta. Ol pipol we oli kakae ol selfis ia oli kasem wan sik nem blong hem Paralytic Shellfish Poisoning we i mekem bodi blong olgeta i haf-ded, mo oli stap traot mo samtaem maet oli save ded.

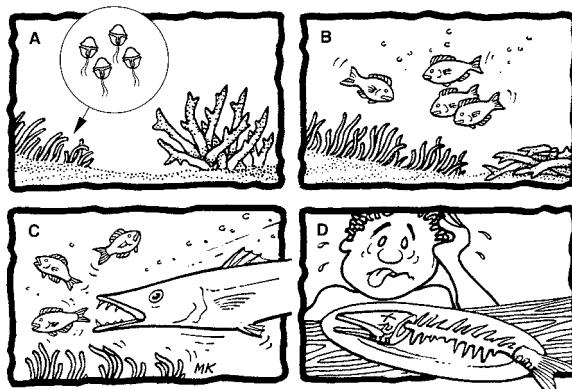
I gat sam HAB we oli prodiusim ol posen we i save spoelem ol pipol we oli stap swim mo wokbaot long laen blong so nomo. Wan kaen posen phytoplankton (*Karenia brevis*) hemi afektem ol man ples mo olgeta turis long taem we oli stap pulum win mo semtaem tekem ikam insaed long olgeta ol posen we i stap insaed long smok blong solwota – from samting ia maet oli harem se skin blong olgeta i muvmuv, hed i raon, oli no save pulum win gud mo oli stap kof.

HAB we i komon bitim ol nara wan long ol aelan kaontri blong Pasifik hemi hemia we i produisim

Ciguatera Fish Poisoning. Pikja daon hemi soem wan katun we oli yusum blong mekem ol pipol oli luksave denja blong sik ia. Olgeta wanwan pikja we i soem i olsem:

- A. Ol posen phytoplankton (maet sam spisis we oli difren, i inkludim *Gambierdiscus toxicus*) yu save faenem plante taem long ol bed blong si gras.
- B. Namba blong ol niutrien we i go antap (olsem wan eksampol, maet oli bin kamaot long ol korel we i damej) i mekem se namba blong posen phytoplankton i go antap bigwan. Ol smol fis we oli stap kakae long si gras oli tekem plante long ol posen ia i go insaed long bodi blong olgeta
- C. Ol fis we i mo bigwan we oli kakae ol smolmol fis oli tekem insaed long olgeta plante mo long posen ia. Ol posen oli kasem ol level we i denjares tumas long sam fis olsem sam long ol redmaot, rif snapa, barakuta, nama-rae, bigfala manngru mo sam nara wan.
- D. Ol pipol we oli kakae ol fis we i gat posen long olgeta oli kasem sik ia ciguatera. Olgeta oli gat ol problem olsem oli harem se bodi i haf ded, mit i stap soa, mo i gat wan difren kaen fasin we oli harem se wan kol samting i hot taem oli tajem, mo wan hot samting i kolkol. Sapos posen ia i strong tumas, man i save ded from, from hemi no save gohed blong pulum win.

Tingting se maet fis i save gat posen long hem i mekem i had blong salem ol kaen fis olsem. Sori tumas, be no mata we i gat plante kastom tingting long saed blong ciguatera, i no gat eni strel fasin, we i no sas mo yu save dipen long hem, blong yu save testem wan fis blong faenemaot sapos hemi gat posen insaed long hem o no. Wan komon bilif i olsem: yu save luk se wan fis i gat posen ia sapos yu livim wan pis blong hem blong letem ol flae i sidaon long hem – sapos ol flae i no wantem kam klosap long hem i minim se fis ia i gat posen. Wan nara bilif i olsem: sapos yu putum wan pis mani we i silva long fis mo pis mani ia i go blak, fis ia i no sef blong kakae. Sori tumas, tufala test ia, mo plante nara wan we ol man i trastem olgeta, i no save wok.



Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmmanetwork.org](http://www.lmmanetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker



## Hao nao yu save katemdaon namba blong ol harmful algal blooms (HABs)?

Yu save katemdaon namba blong sam HABs sapos yu kontrolem hamas niutrien i go insaed long solwota. Oli luk se men sos blong ol niutrien i go long ol solwota long kos i sewage blong ol pipol mo ol animal blong fam long ol ples we sistem blong manejem sewerage i no gud tumas – oli luk se hemia i wan bigfala problem tumas long ol atol we graon wota mo solwota long lagun i save spoel isi nomo..

Rabis wota we i aot long ol ples blong tritim sewage mo wota we i kamaot long septik tang (tang we i stap anda long graon we ol bacteria oli brekemdaon sewage ia) i no mas go insaed long ol riva o solwota long kos. Long sam ples, oli bin planem ol banana o nara kaen krop klosap long ol ples we kaen rabis wota ia i kamaot long hem mo oli ting se ol plant i yusum ol niutrien ia bifo oli save kasem solwota. Wan nara wei hemi blong mekem kompos wetem sewage blong ol pipol mo ol animal blong fam – long fasin ia, ol sitsit i stap go roten fastaem bifo oli yusum olsem fetelaesa blong ol plant we oli stap gru.

Oli mas protektem ol tri we oli gru klosap long ol riva mo long saed blong sanbis, mo long ol eria we i no gat tri oli mas planem bakegen. Najoral plant, we i inkludim ol natongtong we i gru klosap long laen blong so, olgeta oli yusum sam long ol niutrien bifo oli kasem solwota.



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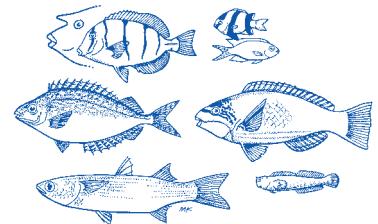


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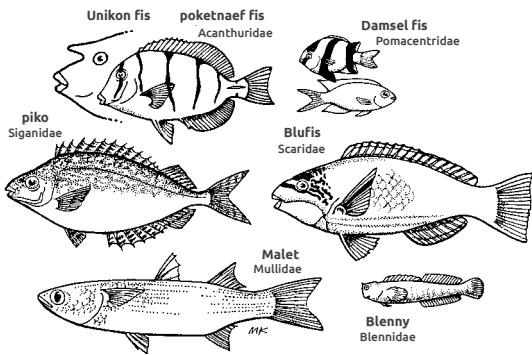
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# Ol fis we oli kakae ol plant



## Ol fis we oli kakae ol plant

Ol fis we oli kakae ol plant nem blong olgeta i ol herbivores. Long ol korel rif, ol fis we oli stap kakae ol plant i inkludim blufis, piko, yunikon fis mo poketnaef fis. Sam nara wan, we yu no luk olgeta tumas from oli smol mo plante taem oli stap daon long ol hol, i inkludim ol blennies. Ol malet oli no stap tumas long ol rif be oli go tugeta long ol bigfala grup ova long bed blong si gras long ol lagun mo eria blong kos we solwota i salo.



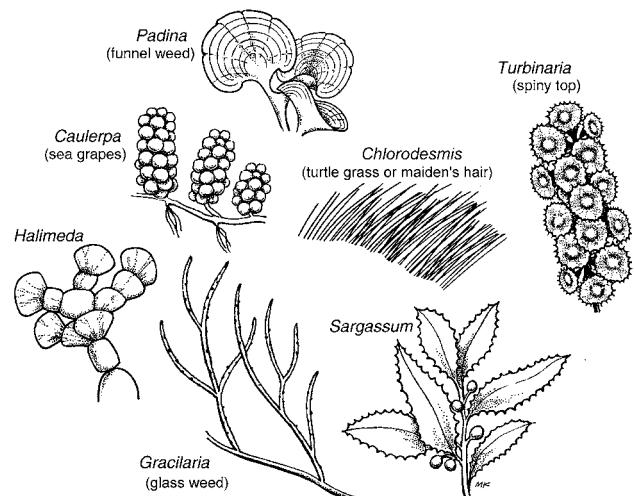
## Hao nao oli kakae ol plant

Plante fis oli kakae ol difren kaen si wid o sam oli stap kakae wan kaen nomo; yu save luk long pikja daon we i soem sam komon si wid.

Olgeta piko mo poketnaef fis oli stap kakae long ol mat. we i olsem gras, blong gras nalumllum we oli gru long ol ples we oli had. Sam kaen fish, olsem damselfish, oli difendem long wan strong fasin wan ples we i gat ol si wid long hem. Convict surgeonfish oli grup tugeta blong swim ova long rif taem oli kakae long hem mo i luk se oli yusum bigfala namba blong olgeta blong mekem ol smolsmol damselfish i fræt. Yunikon fis mo poketnaef fis oli kakae ol si wid we oli braon, inkludim funnel weed, Sargassum, mo spiny top.

Wetem maot we i olsem maot blong nasiviro, sam long ol blufis oli dig igo insaed long pis korel mo sam narawan oli kakae ol difren kaen si wid we i inkludim ol gras nalumllum mo Halimeda we i had (calcified) mo ol korel. Taem oli kakae long korel, sem taem oli kakae ol mit blong korel.

Sam kaen fis oli kakae tuketa, plant mo animol, mo oli kolem olgeta se oli omnivores; malet, blong givim wan eksampol, oli kakae ol smolsmol animol taem oli yang mo taem oli kam bigwan oli kakae ol plant nomo.





#29

# Ol fis we oli kakae ol plant

## From wanem ol herbivore oli impoten?

Yumi taalem se ol plant oli primary producers – minim se oli mekem kakae stret aot long laet blong san, carbon dioxide (we i kam aot long ea) mo ol niutrien long solwota. Ol fis mo ol nara animol we oli kakae ol plant olgeta oli kam kakae blong ol carnivorous animol (olgeta we oli kakae mit), olsem snapa, los mo karong. Ol fis we oli kakae ol plant oli mekem wan impoten samting, taem oli joenem ol plant wetem ol impoten, mo plante taem bigfala, fis we yumi i stap kakae.

Antap long impotens blong olgeta long jen blong kakae, ol fis we oli kakae ol plant i mekem wan nara impoten samting. Sapos olgeta i nokat, ol korel rif oli no save stap laef mo helti oltaem. From ol plant oli gru kwiktaem bitim ol korel, oli kwik blong stap gru long eni ples we i emti. Sapos i no gat eni fis we i kakae ol plant, ol si wid maet oli:

- go stap long ol ples we maet korel i save go setel long hem
- ôgru kwiktaem tumas mo blokem ol korel blong no gat laet blong san we oli mas gat blong stap laef, mo
- damejem ol korel taem oli skrassem olgeta.

Ol korel rif i provaedem hom mo kakae blong ol animol blong solwota we olgeta fising komiuniti i dipen long olgeta blong provaedem kakae. Sapos ol nalulum oli tekem ples blong ol korel, ol rif i no save sapotem ol difren kaen spisis blong olgeta i kakae. Problem ia i gohed long plante ples long wol mo plante taem hemi from namba blong ol fis we oli kakae ol plant oli godaan bigwan from oli kasem tumas blong olgeta.



## Fasin blong manejmen we yu save jusum

Sapos ol lokol gavman otoriti, ol NGO o oganaesen blong rijon i save givim help mo advaes long olgeta, ol komiuniti memba maet oli tokbaot ol kwestin olsem:

**Helt blong ol korel rif we oli stap klosap i olsem wanem?** Wan rif we hemi gat grup blong ol bigfala si wid we i kavremap wan big eria maet hemi stap long denja – maet i gat wan jenis we i stat, mo rif blong korel i gohed blong kam rif blong plant. Ol korel rif we oli helti oli gat smol mat blong gras nalulum nomo mo fiu nomo blong bigfala si wid.

**Sapos rif hemi gat tumas plante si wid, i from wanem rison?** No mata we kwantiti blong niutrien, maet from sewage blong ol pipol o ol animol, i stap go antap, men rison from wanem ol plant i gru tumas hemi from oli kasem tumas long ol fis we oli kakae ol plant.

**Namba blong ol spisis we oli kakae ol plant i stap jenis?** Ol lokol fisa oli mas save sapos taem we oli nidim blong kasem wan basket blong blufis o wan string blong poketnaef fis i stap jenis. Sapos oli tekem mo taem blong kasem wan kaen spisis komperem wetem ol taem bifo, maet i minim se namba blong spisis ia i stap go daon.

Blong protektem ol korel rif, ol aktiviti blong manejmen oli i sud luk fastaem blong protektem ol fis we oli kakae ol plant. Maet oli tekem sam aksen olsem:

**→ Katemdaon namba blong ol fis ia we oli kakae ol plant we oli stap kasem:** maet oli putum wan ban blong ol fisa i no yusum spia blong kasem ol blufis mo poketnaef fis long naet (Luk long pepa blong toksave namba 4). Oli mas putum wan totol ban blong ol taem blong ol fisa oli no yusum SCUBA taem oli fis wetem spia.

**→ Plante long ol fis we oli kakae ol plant,** olsem poketnaef fis, blufis mo piko, oli go long ol bigfala spawning aggregation (luk long pepa blong toksave namba 24). Wetem ol spisis ia, i impoten blong putum wan ban blong ol fisa i no kasem olgeta taem oli stap go tugeta blong mekem pikinini. Sapos no, oli mas katemdaon fising blong ol fis ia taem oli stap spawn.

**→ Mekem ol tabu eria** Ol resev (ol tabu eria) we oli no save go fising long hemi i letem namba blong fis i go antap. Ol kaen fis we oli stap graze (oli muv sloslo ova long wan eria blong kakae mo tekem smolsmol olbaot) oli save mekem ol eria we korel i save sidaon long olgeta i go antap – taem ol fis i stap graze olsem long ol resev oli faenemaot se namba blong korel i go antap tu taems.



Gaed mo ol toksave ia hemi wok blong SPC ([www.spc.int](http://www.spc.int)) we i wok tugeta wetem LMMA ([www.lmmanetwork.org](http://www.lmmanetwork.org)) blong helpem pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen joes. Blong kat mo ekspleneson long ol toktok we istap insaed long Gaed mo ol toksave ia, yu save luk long gaed buk. Foto : Mathieu Juncker



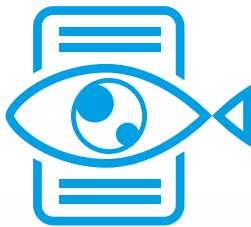
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# Komiuniti risos manejmen

Wan **risos** hemi wan samting we hemi gat valiu mo ol pipol oli yusum. Ol risos blong solwota oli inkludim fis, selfis mo ol nara laef blong solwota. Olgeta risos ia mo wea ples oli stap long hem (envaeromen blong olgeta) oli pat blong **ecosistem** we ol samting we i laef o oli no laef i gat aktiviti bitwin long olgeta.



Men eim blong **manejmen blong ol risos blong solwota** hemi blong mekem sua se yus blong ol risos ia i sastenebol. Hemia i minim se yumi mas manejem ol aktiviti blong yumi blong protektem envaeromen, long graon mo long solwota. Wanem i gohed long graon i afektem ol samting we i stap laef long solwota. Forestri, ol fam, ol maen, developmen we oli no kontrolem mo ol rabis blong taon mo viley i afektem ol ecosistem blong solwota mo ol spisis blong solwota we yumi stap kakae olgeta.

Nid ia blong manejem tugeta graon mo solwota samtaem oli kolem hem wan ridge to reef approach (aproj blong rij go kasem rif) o wan ecosistem aproj. Ecosistem aproj blong manejmen hemi wan stael blong manejem risos we hemi mo waed, we hemi inkludim manejmen blong graon, wota mo ol samting we i laef, we liflet ia i stap tokbaot.

Wan komiuniti we hemi gat strong lida hemi save developem risos manejmen hem wan we i no nidim help i kam long aotsaed. Be komiuniti wetem ol otoriti blong gavman o NGO we oli wok tugeta (samtaem oli kolem **co-management**) i save mekem proses ia l mo isi mo mo efektif.



Ol samting we i mas gat long saed blong komiuniti manejmen blong ol risos blong solwota i stap daon.

## 1. Mekem sua se komiuniti i luksave, i gat konsen mo i hapi blong mekem sam samting

Wan komiuniti i mas luksave valiu blong ol risos blong solwota blong hem mo **gat konsen** long ol problem we oli stap finis. Hemi mas rere blong **tekem ol aksen** we oli nidim blong manejem ol risos blong solwota blong hem; hemi mas rere blong wok wetem gavman sapos ol problem i aotsaed long kontrol blong olgeta.

*Sapos i no olsem, i minim se co-managemen bae i feil.* Olsem namba wan grup we i gat konsen (key stakeholder), komiuniti i mas lid blong mekem proses ia i wok.

Yu mas luk sapos komiuniti i rere raet long stat – long fas miting blong ol komiuniti lida.

- Sapos yu luk se oli no rere, i mo gud sapos yu givim sapot long wan nara komiuniti we i wantem gohed.
- Sapos yu luk se oli rere, yu sud tokbaot fasin blong divelopem co-management mo givim opotuuniti long ol memba blong komiuniti blong askem kwestin. Afta, gohed wetem ol step we i stap, olsem:



## 2. Agri long ol namba wan gol –ol risal we oli wantem

Komiuniti hem wan i mas setem ol gol, no mata we oli bin divelopem olgeta wetem advaes blong wan fasiliteta. Wan eksampol blong wan smol be impoten gol maet hemi "*blong mekem sua se ol fis we mifala i kasem i inaf blong fidim komiuniti blong yumi*".

Wan gol we i bigwan lelebet maet hemi "*blong manejem graon, wota mo ol samting we i laef blong provaedem kakae mo ol nara risos blong komiuniti nao mo long fiuju*".

Komiuniti i mas agri long gol, o olgeta gol, mo oli mas go stret wetem ol nasonal polisi. I gud sapos oli save tokbaot ol gol wetem ol dipatmen blong gavman olsem fiseris o envaeromen, mo oli sud invaetem olgeta ofisa long ol dipatmen ia blong kam long ol eli miting wetem komiuniti.

## 3. Agri long wan manejmen plan wetem ol aksen o step we oli nidim blong ajivim ol gol ia.

No mata we proses i difren long ol difren kaontri, wan komon tingting we i mas stap, hemia blong mekem sua se **komiuniti i involv bigwan**.

I impoten blong involvem ol difren grup blong komiuniti, inkludim ol grup blong ol woman, ol jif, ol hed blong famli, olgeta we oli holem graon, olgeta we oli gat raet long hem, mo ol grup blong fisa blong mekem sua se evri pat blong komiuniti i involv. Tu, taem ia nao blong tokbaot ol aksen mo rul blong komiuniti we oli nidim blong ajivim ol gol.

I impoten tumas blong enkarejem ol pipol blong tokbaot ol problem blong olgeta (we i rilet long ol namba wan gol) mo blong proposem ol ansa. Ol infomesen we oli save yusum hemi tradisonel save long saed ia mo ol infomesen blong saens (luk long ol pepa blong toksave).

I gat plante wei we yu save enkarejem ol pipol blong joen long ol toktok we i inkludim ol aksen (drama), rol plei, risos maping, mo tu yu save yusum ol teknik blong involvem olgeta olsem constructing problem/solution trees mo ol nara wan (Constructing problem/solution trees mo LMMA teknik oli diskraebem olgeta long 2010 SPC/FAO pablikesen "A community-based ecosystem approach to fisheries management, guidelines for Pacifi Island Countries\*")

Men aotkam blong ol miting i mas gat wan agrimen long ol problem mo ol solusen bifo oli disaed long ol aksen we oli mas tekem mo hu nao hemi responsibol blong karem aot olgeta. Olgeta oli save rikodem hem olsem wan aksen plan o wan **Komiuniti Risos Manejmen Plan**. Plan ia, we oli raetem long lokol lanwis, hemi wan impoten dokumen blong olgeta i no save fogetem ol agrimen mo ol rul, mo tu blong soem long ol man aotsaed.



## 4. Aedentifaem o setemap wan smol grup blong mekem manejmen plan ia i wok

No mata we evri pipol blong wan komiuniti i sud sapotem komiuniti risos manejmen, i gat nid blong gat wan smol grup blong stap responsibol long ol aksen we i stap long plan. Maet oli tingbaot grup olsem wan komiti we wok blong hem i blong lukluk long ol aksen mo folem progres. Maet smol komiti ia i gat nid tu blong panisim olgeta we oli brekem ol rul blong majejmen.

Maet komiuniti i save yusum wan grup we i stap finis o maet i setemap wan **Komiuniti Risos Manejmen Komiti**. Ol memba blong komiti maet i ol kastom lida, o ol pipol we oli jusum olgeta, o maet ol pipol oli save elektem ol memba. Komiti tu i mas inkludim ol representatif blong ol grup blong woman mo grup blong ol fisa. Sapos i posibol, komiti ia i sud inkludim representatif blong ol ko-maneja, maet blong gavman o maet blong NGO. Ol memba ia i mas mit evri taem mo wok had blong kipim komiuniti risos manejmen i gohed gud.

## 5. Mekem! – mekem ol aksen we i stap long manejmen plan

Ol komiuniti maneja oli yusum ol aksen, ol rul o **tul** blong ajivim wan gol. Blong givim wan eksampol, maet komiuniti i jus blong putum wan ban blong no kasem ol fis we oli stap spawn mo putum wan ban blong no yusum sam kaen fasin blong fising we i stap spoelem ol fis.

Blong protektem ol ecosistem blong solwota maet oli disaed blong planem ol tri raon long riva we i stap klosap blong preventem erosen, blong protektem eria blong natongtong, mo blong protektem wan eria blog korel rif taem oli setemap wan **Marine Protected Area**.

Hemia i sam eksampol blong ol tul we oli save yusum – yu save yusum ol difren wan blong ajivim sem mak gol.



## 6. Jek blong luk se oli karemaot ol aksen

Yu mas folem wok blong komiuniti risos manejmen mo luk long hao hemi stap wok. Yu mas luk blong faenem ansa long ol kwesten olsem:

- Komiuniti Risos Manejmen Komiti hemi stap miting evri taem?
- Hemi gat sapot blong komiuniti lida? - jioj? - ol pipol?
- Ol pipol oli respektem ol rul we komiti i bin mekem?
- Komiti hemi enfosem ol rul we ol pipol oli agri long hem?

## 7. Luk sapos plan i stap wok

Yu mas folem mo luk sapos ol aksen mo ol tul oli ajivim (sapos no yet, mekem progres i go long) ol gol we oli bin disaed long olgeta. Sapos samting ia i no olsem, yu mas mekem sam difren aksen.

- Tabu eria i stap wok? Namba blong fis i go antap?
- Ban long no fis wetem net hemi mekem namba blong fis i go antap?
- Ban long no kasem sam kaen spisis i mekem namba blong fis i go antap?
- Namba blong fis we oli stap kasem i go antap, o i no go daon tumas?

Sapos ol manejmen mesa we yu tekem oli no wok, yu mas tekem sam nara mesa. Proses ia yumi kolem **adaptive management** – minim se yu traem fastaem sam mesa blong manejmen we yu luk se i stret, afta yu luk sapos oli wok; sapos no, yu mas jenism olgeta smol, o putum sam difren mesa.



## Sapot we i gohed

Tingting i olsem: sapos komiuniti i stap manejem ol risos blong hem mo i gat ol benefit we olgeta oli save lukim olgeta, komiuniti manejmen i save gohed hem wan. Be maet ol komiuniti i faenem se i gud sapos oli save gohed long ol yia we i kam blong toktok wetem ol nara oganaesesen aotsaed long komiuniti.

Sapos wan nara oganaesesen hemi involv, maet i tekem plante yia blong ol visit i go long komiuniti evri taem blong mekem sua se ko-manejmen i stap gohed. I mo gud blong luk long wan wei we sapot blong aotsaed i save gohed blong go daon smolsmol, from i nogud sapos sapot mo enkarejmen long komiuniti i finis kiwtaem olgeta.

## Blong ekstendem komiuniti risos manejmen i go long ol nara komiuniti

Blong seraotem ol benefit igo long ol nara komiuniti, ol komaneja o oganaesesen we i stap olsem pat blong program ia i mas mekem sua se i gat plante ripot tru long midia long fasfala fising komiuniti we i bin setemap komiuniti bes risos manejmen.

Ol intaviu long redio wetem ol lida long fes viley oli wan gud wei i blong kasem intres blong sam nara komiuniti. Sapos i gat sam smol fanding istap, maet i gud blong oganaesem ol visit bitwin long olgeta komiuniti we oli praktisim risos manejmen wetem ol komiuniti we oli intres blong mekem olsem; hemia i wan namba wan wei blong seraotem program ia.

No mata wanem kaen loa i stap we gavman i traem mekem ol man i folem, responsibol manejmen blong ol risos blong solwota i save gohed gud sapos olgeta fising komiuniti olgeta nomo oli luk se i responsibiliti blong olgeta.

[http://www.spc.int/DigitalLibrary/Doc/FAME/Manuals/Anon\\_10\\_EAFguidelines.pdf](http://www.spc.int/DigitalLibrary/Doc/FAME/Manuals/Anon_10_EAFguidelines.pdf)



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The Locally-Managed Marine Area (LMMA) Network



Improving the practice of marine conservation  
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UNION EUROPÉENNE

Liflet ia Michael King hemi bin rae tem wetem infomesen mo komen i kam long Michael King with information and comments supplied by Mike Batty, Lindsay Chapman, Ian Bertram, Hugh Govan, Simon Albert, Etuati Ropeti, Being Yeeting, Kalo Pakoa, Aymeric Desumont, Maria Sapatu, Jeff Kinch, Simon Foale, Ron Vave, Toni Parras, Jovelyn Cleofe, Alifereti Tawake, Wendy Tan, Stacy Jupiter, Pip Cohen, Tom Brewer, Tevi Maltali, James Comley, Victor Bonito, Magali Verducci, Julien Grignon, Semisi Meo and Michael Guilbeaux.

# Ol tabu eria we komiuniti i manejem olsem pat blong manejmen blong fiseris



Oli raetem liflet-ia blong givhan long ol fising komiuniti, mo olgeta we oli wok wetem, blong setemap mo manejem ol no-take eria (ol tabu eria).



## 1. Ol tabu eria i wanem?

Ol no-take eria i ol eria we i gat wan ban long fising. Maet oli kolem hem wan resev o eria we i klos, o ra'ui, tambu mo tabu o nara lokol nem we ol fising komiuniti long Pasifik oli bin yusum ova long plante handred yia.

Wan permanent no-take area i wan we i klos oltaem long fising, Wan periodically fished no-take area hemi wan we i klos long fising ova long wan taem we maet i fiu manis nomo o maet i sam yia.

Sam nara kaen i inkludim ol periodically closed area we oli banem fising, long sam stret taem we plante taem i smol nomo blong protektem ol fis we oli stap mekem pikinini o ol spawning aggregation blong ol spisis blong solwota.

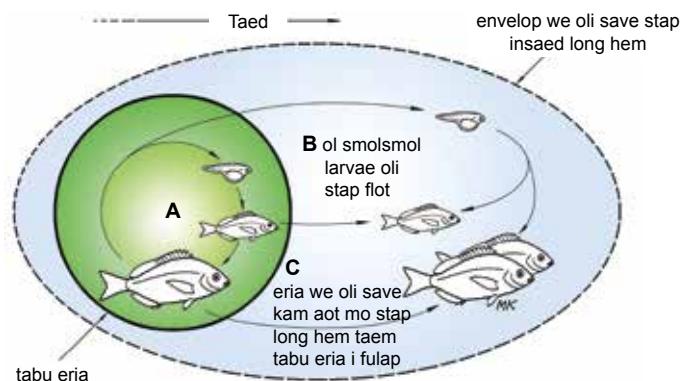
## 2. Wanem i pepos blong ol tabu eria?

Ol tabu eria we oli klos oltaem oli provaedem sapot oltaem ova wan long taem blong protektem ol ekosistem, ol ples we ol fis i stap long hem mo ol spisis we oli sapotem. Oli hop se ol spisis long ol tabu eria olsem oli save gru, mekem pikinini mo seraot olgeta i go long ol fising eria klosap we ol fisa i save kasem olgeta.

Long ol tabu eria we oli klos ova long wan stret taem mo oli open long fising long wan nara taem, pepos blong olgeta i lelebet sem mak. Taem eria ia i klos, ol fis oli save gru mo mekem pikinini. Taem i open bakegen, yu save kasem plante long ol fis we oli mo big insaed long tabu eria.

## 3. Long wiswe ol tabu eria oli save inkrisim hamas fis oli save kasem?

Long figa 1, tabu eria hemi stap insaed long blak sekel. Pis long tabu eria oli mekem pikinini mo oli putumaot ol smolsmol larvae we maet (A) oli setel mo stap kwaet long tabu eria o (B) flot wetem taed blong go setel mo gru aotsaed long tabu eria. Ol yangfala mo ol fis we oli gru finis, olgeta tu oli muv aot long tabu eria olsem spill-over (C), maet from eria ia i fulap tumas.



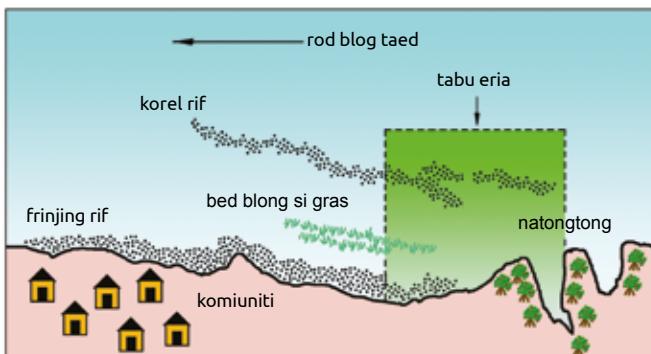
**Figa 1.** Ol smolsmol larvae we oli prodius long tabu eria (blak sekel) maet oli (A) setel insaed long tabu eria ia o (B) flot igo insaed long dispersal envelope we i seraot wetem taed. (C) ol yangfala mo ol fis we oli gru finis oli spill ova long ol eria klosap. (oli tekem tingting ia aot long King, 2007. Fishery biology, assessment and management. Wiley Blackwell, UK)



#### 4. Wea ples, mo long wanem saes, i stret blong wan tabu eria?

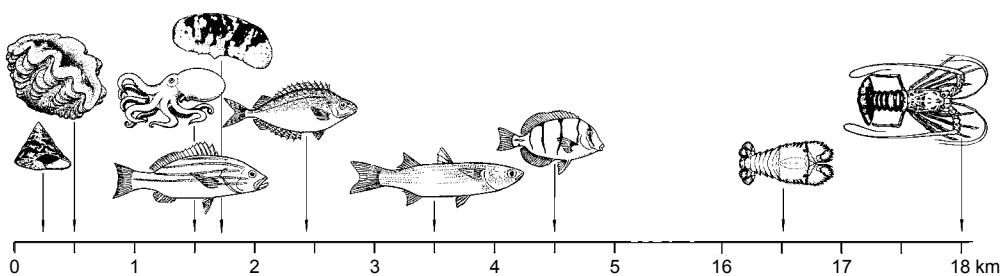
Wan tabu eria, we i klos oltaem o we samtaem oli fis insaed long hem, hemi save impruvum namba blong fis we oli kasem, be i no sem mak long evri spisis mo i no kwiktaem evri taem. No mata we ol tabu eria we i mo big maet i save mo gud, be ples we oli stap long hem i mo impoten bitim saes blong hem. Luk long ol tingting daon:

- Putum tabu eria long wan ples we i inkludim sam difren habitat (ples we fis i stap long hem).** Tru long saekol blong laef blong hem, plante spisis oli yusum bitim wan habitat. Sapos i gat plante korel, bed blong si gras mo natongtong long wan tabu eria, tabu eria i save kam wan gud wan (Figa 2). Sam fiu spisis, olsem si-kukamba mo sam natalae, oli nidim eria blong sanbis mo eria we i gat ol korel rabol (pis blong ded korel) long hem, be ol nara spisis i no nidim tufala, sanbis wetem korel rabol, insaed long tabu eria blong olgeta.
- Putum tabu eria klosap long nara impoten habitat.** Tabu eria hemi sud stap klosap long ol nara impoten habitat, no mata we oli no stap insaed long tabu eria. Oli luk se ol tabu eria we oli stap long rif oli gat mo sakes sapos oli putum olgeta klosap long bed blong si gras o klosap long ol natongtong.
- Putum tabu eria long wan ples we i impoten tumas long ol impoten spisis.** Maet eria ia i inkludim eria blong kakae, eria blong mekem pikinini, eria blong spawning aggregation, mo eria blong neseri blong wan spisis.
- Putum tabu eria long wan ples we yu save wajem hem.** Ol memba blong komiuniti oli mas protektem mo gadem tabu eria ia.
- Putum tabu eria long wan ples we taed i ron i go long fising eria.** Ol taed ia maet oli givhan blong karem ol smol-smol larvae igo insaed long fising eria (Figa 2). Ol taed long kos mo insaed long wan lagun long kos plante taem oli go long fored mo bihaen, be oli gat wan taem we i gat wan muvmen long wan daerekseen (sapos i no gat ol stret infomesen long saed blong tradisonel save o long saens, yu save faenemaot samting ia sapos yu folet rod blong sam plastik botel we oli gat wet long olgeta ova sam saekol blong taed mo blong mun). Yu mas save se muvmen blong ol larvae oli save kompliketed lelebet mo maet oli rilet long ol taem blong spawning we oli tek ples long wan taed.



**Figa 2.** Wan gudfala situesen we wan fising komiuniti i bin putum wan tabu eria blong inkludim pat blong wan ofso rif, wan rif we i klosap long so, ol bed blong si gras mo wan eria blong natongtong. Tabu eria i stap antap long taed we muvmen blong wota i save karem ol larvae igo long fising eria blong komiuniti.

- Sapos i no posibol blong gat wan bigfala tabu eria, plan blong mekem wan we i mo smol.** Ol smol tabu eria i gud blong ol spisis we oli no muv olbaot tumas, olsem nawita, natalae mo sam kaen fis blong rif. Be hemi no save protektem gudwan olgeta spisis we oli muv ova long ol bigfala eria o ples blong kakae. Sam fis, olsem malet, we oli go long wan long distens long kos, wan smol tabu eria i no yusful tumas long olgeta.
- Wok wetem ol komiuniti klosap long yu blong setemap wan netwok blong tabu eria.** Sapos yu save setemap ol tabu eria we oli smol nomo, plan blong setemap plante smol tabu eria olsem olgeta long Samoa o long Coral Coast blong Fiji i bin mekem. Wan netwok blong tabu eria, we wan eria i 10 kilomita aot long ol nekis wan maet i help blong joenem ol ples we ol smolsol larvae oli kamaot long hem mo ol gudfala ples we oli save setel.
- Maet igud blong tinkbaot tu tabu eria, we wanwan i gat difren pepos.** Sapos i gat tu eria we oli klosap be seperet, maet wan hemi save stap olsem wan tabu eria we i stap oltaem mo nara wan we oli save havestem long sam taem long wan fasin we oli save kontrolem.
- No ekspekteblong lukim sam risal naoia nomo.** Plante spisis oli tekem wan long taem blong gru blong kam bigwan mo mekem ol pikinini. Taem ia i no sem mak long evri spisis. (Luk long ol pepa blong toksave.)
- No ekspekteblong lukim sam risal naoia nomo.** Plante spisis oli tekem wan long taem blong gru blong kam bigwan mo mekem ol pikinini. Taem ia i no sem mak long evri spisis. (Luk long ol pepa blong toksave.)



**Figa 3.** Distens we maet ol larvae i flot bifo oli setel olsem pikinini animol. Hemi bes long muvmen blong 50 mita long wan dei.

## 5. Hao nao yumi save manejem tabu eria blong yumi?

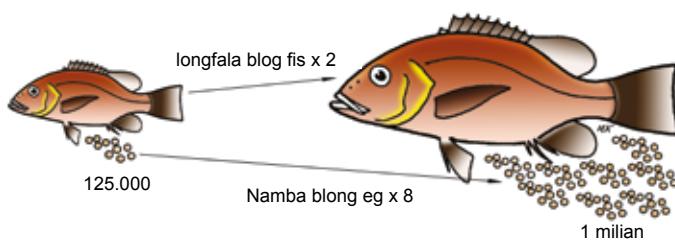
Wan tabu eria hemi nidim sapot mo manejmen blong komiuniti. Sapos evriwan i agri se oli setemap wan tabu eria mo oli luksave from wanem, maet olgeta oli save rispektek ban long fising ia. Komiuniti i mas makem gud eria blong mekem se evriwan i save ol baondri blong blong tabu eria mo komiuniti i mas panisim eniwan we i brekem ol rul blong no fising.

No mata we komiuniti i save benefit long wan tabu eria we i stap oltaem, plante oli stap open long sam taem blong oli save fising long hem. Sam long olgeta tabu eria ia oli mekem wan disisen blong openem hem long sam taem – maet long ol spesol taem, we i inkludim taem i gat wan mared, taem man i ded mo fanresing. I isi blong ol man i ting se oli mas openem eria o maet wan man i disaed hem wan blong stilim sam fis; problem ia i kam antap taem ol pipol oli luk se namba blong fis long eria i go antap (wanem oli kolem fish jumping long naet oli ripotem plante taem).

Fising we oli no save kontrolem afta we wan tabu eria i open bakegen hemi save kam wan bigfala problem olgeta. Samting ia i save kam antap bigwan sapos eria i open blong longfala taem mo i gat plante tumas man i stap go fising insaed long hem. Maet oli kasem wan namba blong bigfala fis o maet ol bigfala fis i ronwei aot long eria, be ol habitat, espeseli ol korel, maet ol pipol oli stap stanap long olgeta mo spoelem olgeta, sapos oli kasem ol animol tru long fasin blong wokbaot long rif. Sapos i gat tumas damej, maet oli no save goheda blong yusum ples ia bakegen olsem tabu eria.

Maet yu tingbaot mekem sam long ol samting ia blong katemdaon ol problem taem tabu eria i open bakegen:

- a) **I gud sapos yu klosem tabu eria oltaem o yu openem wan wan taem nomo be ino evritaem.** I gat mo benefit sapos yu no openem tabu eria nating o sapos taem i klos i goheda long taem lelebet. Taem i open plante taem, i des-tebem laef blong ol spisis we i stap long solwota mo maet hemi damejem ol habitat.
- b) **Openem tabu eria blong wan sot taem nomo.** Limitim taem blong fising i go long haf blong wan dei o anda long haf, mo mekem sua se ol pipol oli save long wanen taem bae i open mo wanem taem bae i klos bakegen.
- c) **Putum wan limit long namba blong ol fisa we oli alao blong go insaed long tabu eria taem i open.** Sapos i gat smol namba blong ol fisa oli no save mekem tumas damej. Ol fisa i mas kam aot long lokol komiuniti nomo.
- d) **Letem ol fisa i tekem ol spisis nomo we yufala i selektem.** Letem olgeta i kasem nomo ol spisis we oli stap gru kwiktaem o wan smol namba blong olgeta we oli gru sloslo.
- e) **No letem ol fisa i kasem sam long ol bigfala fis.** Samtaem taem wan tabu eria i open, ol fisa oli tekem ol bigfala fis we oli save prodiusim mo pikinini. Olgeta bigfala fis oli prodiusim plante plante mo eg; sapos wan woman fis hemi alao blong gru mo dabolet saes blong hem, namba blong eg we hemi putum i save go antap taemes 8 (luk long Figa 4).
- f) **Taem yu openem tabu eria, ristiktim kaen fising tul we oli save yusum.** Sam fasin blong fising, olsem wetem net, i mekem mo damej bitim sam nara fasin, olsem fising wetem laen aot long wan bot o kanu.
- g) **Taem yu openem tabu eria, putum wan limit long hamas fis oli save tekem.** Setem wan smol kwota, mo kolektem nomo olgeta fis we yu nidim. Komiuniti i mas agri blong putum bak ban taem oli kasem stret namba ia.
- h) **Tingbaot taem blong openem tabu eria.** I nogud yu openem eria taem wan impoten spisis oli stap brid o oli go tugeta blong spawn.



**Figa 4.** Sapos wan fis i dabolet saes blong hem (x 2) namba blong eg we hemi prodiusim hem i inkris eit taems (x 8)



## 6. Hao nao yumi save se tabu eria i benefitim yumi?

Sapos wan manejmen aksen olsem blong mekem wan tabu eria i wokaot gud, yu save harem save taem yu luk long hamas taem o efot i tekem sem namba blong ol fisa blong tekem wan amaon blong kakae, olsem, hamas taem i tekem olgeta blong kasem wan string blong fis, wan basket blong natalae, wan namba blong naora.

Sapos taem ia i go daon, namba blong fis mo ol nara spisis maet i go antap, minim se tabu eria i stap wok gud.

Sapos taem ia blong fising hemi stap go antap, tabu eria i no stap wok gud. Maet i gat nid blong jenisim fasin blong manejmen o tekem sam mo mesa antap long hem. Yu save tokbaot ol kwestin ia long wan komiuniti miting:

- a) **Olgeta pipol blong komiuniti i save gud tabu eria mo ol rul blong hem?** Olgeta oli save gud from wanem i gat wan tabu eria mo oli folem ol rul blong no fising? Sapos no, tokbaot ol wei we oli save folem blong impruvum situesen ia.
- b) **Tabu eria hemi smol tumas o i no stap long wan gud ples?** Luk long Seksen 4.
- c) **Tabu eria i gat tumas polusen we i spoelem hem?** Polusen wetem silt mo sewage hemi wan big problem we i spoelem ol habitat long ol aelan blong Pasifik.
- d) **Ol eria mo habitat aotsaed long tabu eria olgeta oli stap long wan nogud kondisen?** Ol animol we oli prodiusim long tabu eria oli dipen long ol habitat we i stap klosap, olsem ol bed blong si gras mo natongtong, blong komplitim laef saekol blong olgeta.
- e) **I gat mo pipol we oli go fising?** Sapos i gat mo pipol we oli go kasem mo salem fis, tabu eria we i stap maet hemi no save prodiusim inaf fis blong tekem ples blong olgeta we oli kasem. Long fiuja, maet i gat wan nid blong ristiktim hamas fis oli kasem mo namba blong olgeta fisa.

Ol tabu eria (sapos oli klos oltaem o sapos oli openem olgeta long sam taem blong kasem fis) i wan wei blong manejem wan fiseris. Olgeta i wan impoten tul long tulbokis blong ol manejmen kontrol, we yu save luk sam long olgeta insaed long *Gaed blong ol pepa blong toksave* blong SPC.



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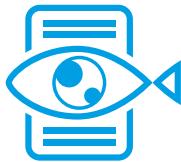


*Improving the practice of marine conservation*



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# Rabis fasin blong fising

Evri fising hemi mekem damej long sam fasin. Taem yu tekemaot wan spisis long solwota, espeseli wan hae namba blong hem, i afektem web we i kompliketed lelebet blong ol koneksen bitwin ol spisis. Mo plante long ol fasin blong kasem fis i kasem olgeta kaen fis we oli no wantem kasem, wanem yumi kolem by-catch.

No mata we fising i afektem envaeromen blong solwota mo ecosistem long sam kaen fasin, i gat sam tul blong fising mo sam fasin blong fising we i mekem tumas damej mo yumi mas katem daon yus blong olgeta.

You save luk se wan fasin blong fising i wan rabis wan sapos :

- i mekem fisikol damej long ol eria klosap, olsem sapos oli digimap botom blong solwota o brekem korel
- i kilim bigfala namba blong spisis sem taem wetem ol spisis we oli wantem fisim
- i wok gud tumas minim se i no gat inaf fis long solwota blong mekem pikinini

Las wan antap hemi wan had wan. Olgeta fisa oli wantem fis long wan fasin we i wok gudwan. Be sam kaen tul blong fising mo fasin blong fising i wok gudwan tumas – olsem eksampol, wan net wetem smol hol long hem we oli putum long wan hol blong rif maet hemi kasem evri wanwan fis we oli traem swim tru long pasej ia.

Bigfala pepos blong manejmen blong ol fiseris hemi blong mekem ol fiseris ia i sastenebol. Minim se, blong mekem sua se ol fiseris bae i stap long fiuja blong provaedem fis blong pikinini blong yumi mo blong pikinini blong olgeta, olsem ol abu blong yumi. Evri taem yumi mas livim inaf fis long solwota blong mekem pikinini mo blong provaedem fis blong fiuja. Mo, antap long hem, yumi i mas lukaotem gudwan ol ples we ol fis i stap laef long hem, yumi mas lukaotem gud envaeromen – ol kos, ol eria blong natongtong mo ol rif. Mo from wanem i gohed long graon blong yumi i afektem wanem i gohed long solwota, yumi mas kontrolem wota we i ron aot long graon i go long solwota we i gat sedimen mo sitsit long hem.

Olgeta ia i ol kaen rabis tul mo rabis fasin blong fising we oli yusum long aelan kaontri long Pasifik:



## ► Ol eksplosif olsem daenamaet

Ol eksplosif olsem daenamaet (plante taem oli tekem aot long ol ples we oli wokem maen o rod, o maet tu aot long polis) oli yusum blong mekem fising long sam aelan kaontri blong Pasifik. Maet oli sakem hem aot long kanu i go long wan grup o skul blong fis olsem malet, o maet oli putum hem long korel mo oli enkarejem ol fis blong kam tugeta long ples ia taem oli putum bet. Ol eksplosif plante taem oli denjares long ol smolsmol animol, olsem ol larvae blong ol fis mo ol polyp blong korel, kompea wetem ol bigfala fis. No mata we loa i no alaoem wan man blong pem eksplosif, maet ol pipol long ol komiuniti we i stap longwei aot long taon oli yusum samting ia mo seraotem ol fis raon long komiuniti. Yu save luk wan katun (daon) blong mekem publik i luksave wanem kaen damej we i gohed long taem olsem risal blong yusum ol eksplosif blong fising wetem.

Taem yu wantem wan kokonas, yu no katemdaon ful tri



Olgeta pipol we oli yusum danamaet mo kemikol blong kilim fis, oli kilim olgeta rif blong yumi. Mo sem taem oli kilim fiuja blong yumi

Olgeta komiuniti i mas sapotem nasonal gavman blong preventem yus blong eksplosif blong fising wetem.

Long Vanuatu, loa blong Fiseris hemi no aloem yus blong eksplosif blong fising mo ikat faen we isave kasem VT500,000 000 o save go long kalabus blong 2 yia.

## ► Ol posen kemikol

Long sam kaontri yu save pem long stoa ol posen olsem savel (Sodium hypochlorate) we oli yusum blong kasem ol fis. Oli kapsaetem savel long ol pul we oli seperet long solwota taem solwota i drae blong kilim mo kasem smol fis long korel. Savel hemi save kilim tu sam nara smol animol, inkludim ol korel, sapos i tajem olgeta.

Olgeta komiuniti i mas putum wan ban blong no yusum ol kemikol blong fising wetem; gavman hemi sud askem ol stoa blong putum wan woning long ol botel blong savel

Long Vanuatu, loa blong Fiseris hemi no aloem yus blong kemikol blong fising mo ikat faen we isave kasem VT500,000 000 o save go long kalabus blong 2 yia sapos man hemi yusum kemikol blong fising.

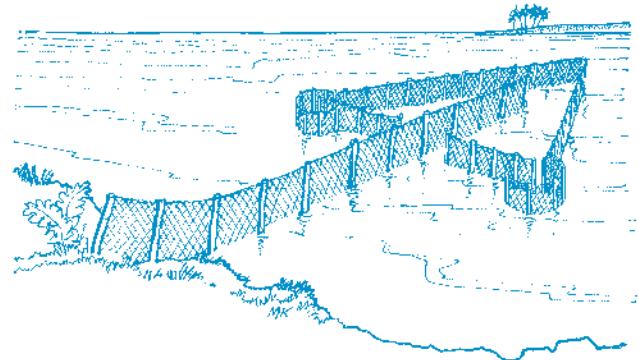


# Rabis fasin blong fising

## ► Trap wetem wol mo fanis

Wan trap wetem wol o fanis hemi wan long ol olfala wei blong komiuniti i kasem fis bitim ol nara wei. Hem i wan isi tradisonal trap we oli stap yusum taem solwota i drael blong blokem fis insaed long ol wol blong ston o korel we i stap olsem leta V o long haf sekel. Oli save putum wan net long ples we rif i open blong kasem ol fis taem oli wantem go bak lo dip wota taem we solwota i go daon.

Long ol fanis trap i gat wan fanis or wan wol we oli bildim long raet ankel long laen blong so o long rif blong blokem ol fis we oli stap muv i go tugeta long wan ples we i blok istap. Taem we fis i kasem fanis oli swim folem fanis go kasem ples we i blok mo oli no save ronwe long hem. Ol fasin blong mekem fanis ia oli folem kastom blong olgeta blong bifo mo oli defren long ol defren ples.

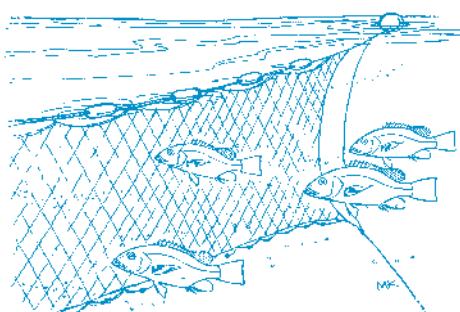


Ol komiuniti i mas putum wan limit long hamas trap oli save bildim long ol fising eria klosap.

Long long taem bifo oli stap mekem fanis ia long ston, mo komuniti i wok wan ples long taem, maet plante manis, blong finisim, be naoia oli save mekem wetem ol materiel blong tedei olsem net waea, olsem yu save luk long pikja daon. Tedei wan komiuniti maet hemi gat plante trap olsem we wan wan famli i bin mekem. From plante man i stap yusum ol trap olsem i minim se i stap mekem namba blong fis olsem malet long Tonga i stap godaon plante. Long sam komiuniti long Samoa oli putum wan limit long hamas trap oli save bildim long ol fising eria klosap. Long Vanuatu, fiseris rekuleson I talem se eni man we I wantem blong yusum fis trap blong fising, hemi mas askem pemison long Daerekta blong fiseris mo hemi save yusum nomo taem Daerekta hemi otoraesem.

## ► Ol gill net

Gill net i ol pis net we i gat flota raon long top blong hem (floatline) mo ol wet long botom blong hem (leadline), minim se i save hang daon stret insaed long wota. Net ia yu save fasem hem blong hang long salo wota blong kasem some kaen spisis blong fis olsem malet o manggru. Net ia oli stap mekem long ol naelon tred we klosap yu no save luksave, mo i save fas bihaen long sora (gill) blong fis, mo oli angka olgeta net ia long salo wota.



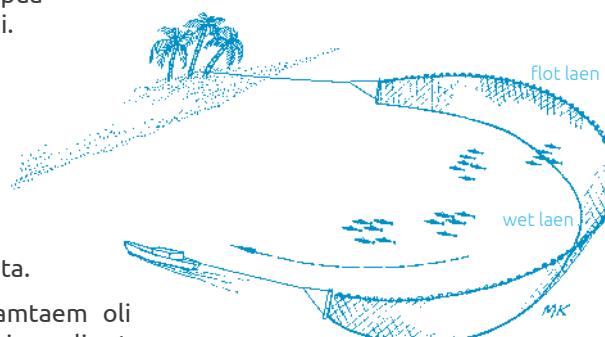
Ol problem i kam antap taem oli putum ol gill net we i kavremap ol smol rif pasej, kanal o maot blong riva. Long situesen olsem, i no gat eni fis we i save go pas long ol net ia. Fasin ia blong fising hemi mekem tumas damej taem oli putum ol net blong kasem ol fis taem oli swim igo long wan spawning aggregation site (look long SPC Pepa blong tyoksave namba 24).

Ol komiuniti i mas putum kondisen long weaples oli save yusum ol gill net. Plante gavman oli putum finis ol minimam mesh saes (saes blong hol blong net), 3 inch (8 sentimita) mesh saes hemi wan komon minimam.

## ► Ol tul blong fising we oli pulum blong krosem long botom blong solwota

Ol fising met we oli pulum blong krosem long botom blong solwota oli save mekem mo damej bitim ol net we oli stap long wan ples nomo. Tolaen oli pulum bihaen long ol fising bot blong kasem spisis olsem ol smol naora long Papua Niugini mo Hawaii.

Olgeta net ia oli kasem big namba blong difren spisis mo oli save damejem ol bigfala eria long botom blong solwota.



Wan seine net (samtaem oli kolem beach seine sipos oli setemap aot long so) i gat longfala panel blong ol net we i raonem wan skul blong fis mo blong pulum olgeta i kam long so. Net ia hemi gat ol wet blong kipim botom blong net i stap strong long botom blong solwota, mo flota we i mekem net i flot i stap antap. Sam long ol bij seine oli gat wan net bakegen long medel blong olgeta we i slak mo i olsem wan bag blong holem taet fis. Ol fasin blong sakem seine net i difren oltaem be plante taem en blong net ia i mas gat wan angka we i stap long so mo wan bot we oli yusum blong putum net ia long wan haf sekel wetem en blong hem long so bifo oli pulum i kam (luk long pikja). No mata wiswe oli yusum net ia, wan seine net i save kasem klosap evri fis long rod blong hem mo i save damejem korel tu mo ol bed blong si gras.

Long Vanuatu, loa blong fiseris hemi mekem I tabu blong yusum seine net we mes saes blong hem I smol bitim 50 milimita.

Ol komiuniti i mas putum ol kondisen long wea ples oli save yusum ol bij seine mo putum ol minimam mesh saes



## ► Fis draev

Wan fis draev hemi wan aktiviti blong wan grup, we plante taem grup ia hemi evriwan blong komiuniti. Oli putum ol net long salo wota long wan rif o lagun mo olgeta we oli stap swim oli ronem ol fis i go insaed long net mo wanem oli talem scare lines. Oli save ronem ol fis wetem ol lif blong kokonas we oli taetem long wan rop o oli save mekem olgeta fis i fraet taem oli kilim solwota wetem stik o oli sakem ston. Minim se evri fis i go insaed long wan pat blong net mo oli save pulum olgeta aot long wota o oli kasem olgeta wetem spia.

**Olgeta komiuniti oli mas blokem olgeta blong no ronem ol fis, sapos no, katedaon namba blong ol ples we oli alao blong mekem.**

Maet oli gohed blong ronem ol fis mo mekem oli fraet be oli no yusum ol net blong mekem; oli save ronem ol fis long wan eria we i isi blong spiarem olgeta, or maet oli ronem olgeta blong go insaed long wan bigfala trap o basket. Taem oli ronem ol fis olsem i save gat plante damej long botom blong solwota wetem ol korel.

## ► Ol posen plant

Blong yusum ol posen plant i wan tradisonel fasin blong kasem fis. Ol plant we oli yusum i inkludim wan rop, *Derris*, mo fis posen tri *Barringtonia asiatica*.

*Derris* hemi wan plant we i stap klaem we i blong famli blong ol bin, yu save smasem ol rus blong hem blong prodiusim rotenone, wan posen we i save kilim ol insek mo fis. Rotenone o derris paoda hemi wan posen we i strong tumas mo hemi save damejem nogud envaeromen blong yumi.

Fis posen tri hemi gru long ol eria blong natongtong mo, from ol frut blong hem we wota i no save spoelem oli stap flot long ol taed, yu save faenem olgeta long plante ples long

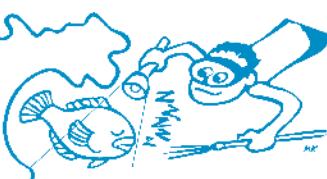
Indian mo Pasifik Osen. Ol sid, we i gat posen saponin insaed long olgeta, oli save smasem blong mekem paoda we oli yusum blong mekem fis i hafdet o kilim i ded ol fis. I gat wan foto blong tri ia (daon) mo bigfala pink mo waet flaoa istap long smol pikja insaed long hem.

Oli save yusum posen blong tufala plant long sam difren kaen wei. Fisa oli save draevem ol fis long selta long wan korel hed we oli selektem finis mo we oli bin putum tu o tri pasel blong posen ia.



## ► Fising wetem spia long naet

Fising wetem spia hemi wan komon fasin blong fising long plante aelan kaontri blong Pasifik mo plante taem hemi no mekem damej long ol spisis o long envaeromen. Be nao i isi blong pem ol toslet we i no sas mo yu save yusum olgeta andanit long wota hemi alaoem ol fisa blong fising wetem spia long naet. Fasin ia blong fising hemi no gud nating long ol kaen fis we oli stap slip long ol korel mo ol salo eria blong rif.



Some long ol bigfala fis, olsem blufis, oli slip long ol krak mo hol olbaot long korel long naet afta we oli bin kavremap olgeta wetem wan web we yu save luk tru long hem we oli mekem wetem spet blong olgeta. Web blong spet ia i save blokem ol bebet mo haedem smel blong blufis ia from ol nara fis we oli stap kakae olgeta long naet. Ol fis ia i isi tumas blong kasem wetem spia mo long sam eksampol ol bigfala blufis oli bin tekemaot evriwan long lagun. Lus blong ol fis olsem blufis we oli kakae ol plant i minim se long sam rif ol si wid i bin tekem ples blong ol korel.

**Olgeta komiuniti i mas putum wan ban blong no yusum spia blong fising long naet mo mas katemdaon fising long ol kaen fis we oli kakae ol plant.**

## ► Pikimap long han nomo (gleaning)

Karem ol animol mo ol si wid long lagun o long rif taem solwota i drae hemi wan kaen aktiviti we yumi stap mekem evri taem, espeseli ol mama mo ol pikinini. I gat plante kaen animol blong solwota we oli stap karem long fasin ia, olsem si-kukamba, si ejen, krab, snel blong solwota, si wid, namarae, smol fis, wom, naggalat blong solwota mo nawita. Blong karem ol samting ia, yumi save yusum han, sam long olgeta olsem kokias yumi mas digim insaed long sanbij o sofmad wetem fut, sam yumi tanem ol ston o korel o brekem hem, mo yusum stik mo huk blong pulum nawita, krab or fis aot long hol insaed long rif.

**Olgeta komiuniti i mas putum wan ban blong no letem ol pipol oli brekem korel blong kasem fis.**

Fasin ia hemi wan impoten fasin blong kasem kakae, taem i raf tumas blong go aot long solwota. Plante taem wanwan fisa i save karem smol namba nomo, be taem plante fisa oli wok olsem oli save kasem plante long ol animol blong solwota mo taem evriwan i mekem olsem i save gat bigfala damej long ol eria bitwin hae mo lo taed. Long sam kaontri oli minim blong stap brekem ol korel long kasem ol fis we oli stap haed – long sam komiuniti long Samoa oli bin putum wan ban long rabis fasin ia blong fis we oli kolem *fa'amo'a mo tuiga*.



## ► Trap, net mo ghost fishing

I gat sam kaen tul blong fising we oli gohed blong kasem fis afta we ol tul ia i bin lus o oli livim istap long solwota. No mata we oli no gat bet insaed long olgeta, sam trap oli gohed blong trapem ol fis mo ol gill net oli save gohed blong kasem fis blong plante yia afta oli bin lus. Kaen fising ia oli singaotem ghost fising (ol man we i ded finis, ol spirit blong olgeta oli stap fis!) mo hemi wan wari long plante ples long wol.

Ol fising tul we ol fisa i nomo yusum oli mas tekem aot long ol lagun mo long ej blong solwota.

Blong preventem ol trap blong gohed wetem ghost fising, sam long ol otoriti oli mekem wan rul se ol trap oli mas makem wetem ol materiel we i save roten taem i stap long taem long solwota. Ol gill net, we oli mekem wetem ol plastik net oli no save rot mo oli stap long solwota blong wan long taem olgeta, samtaem oli stap long wan rol olsem balong we ol laef blong solwota i save fas long hem.

## ► Blong yusum ol tul blong pulum win andanit long solwota

Taem ol fisa i yusum ol tul blong pulum win andanit long solwota, olsem SCUBA, i minim se oli save kasem tumas fis kwiktaem. Long sam eksampol, ol daeva we oli yusum ol tul blong pulum win andanit long solwota oli tekem evri naora aot long ol rif, mo tu oli bin tekem tumas si-kukamba aot long wota we i dip. Sam gavman oli bin putum wan ban blong yus blong tul blong pulum win andanit long wota maet long eni kaen fising maet blong naora nomo.

Long Vanuatu, loa blong Fiseris hemi no aloem yus blong SCUBA o ol nara tul we yu save yusum blong pulum win andanit long solwota blong fising. Sapo eni man I wantem yusum ol tul ia, hemi mas aplae long Daerekta mo kasem wan otoraeseson.

Ol rabis fasin blong fising i no from oli yusum ol materiel blong tedei nomo – sam fasin blong fising we i tradisionel olgeta tu i save mekem damej. Long ol taem we i pas, envaeromen blong solwota i save sastenem sam smol damej long wanwan ples from i no gat tumas aktiviti mo i no gat tumas man we i involv long hem.

Be ol populesen oli stap gru klosap long 4% long wanwan yia long samfala kaontri - hemia i minim se long anda long 20 yia populesen bae hemi tu taems populesen blong tedei. Sapos i had finis blong faenem inaf kakae long solwota blong fidim ol pipol nao ia, yu stap ting baot hao nao yumi save faenem inaf kakae long nekis tuenti yia.

Sapos yu tekem wan spisis aot long wan eria, evri taem i mas gat ol risal blong hem. Hemi i from evri spisis hemi wan pat blong wan food web we i kompliketed – yu save luk wan we oli mekem hem i no kompliketed tumas (daon). Taem i no gat fising, taem yu skelem olgeta spisis oli stap stret, no mata we namba blong wanwan spisis i no sem mak evri yia. Be sapos yu tekemaot plante long eni spisis, maet from yu kasem tumas taem yu fising, taem yu skelem olgeta oli no save stap stret, samtaem long wan wei we yu no ekspekte mo hemi nogud olgeta. Wanwan spisis hemi save stap olsem wan predator (hem hemi kasem wan nara kaen fis), wan prey (wan nara kaen fis i kasem hem) mo wan kompe-

tita we hemi wantem sem samting olsem plante nara spisis, mo taem yu tekemaot hem i mas gat sam problem. Ol man blong saens oli givim nem long ifek we i kamaot taem yu tekem wan spisis aot long wan ekosistem trophic cascades.

Tu eksampol long ples ia i soem indaerek ifek we fising i save gat long ol si gras mo ol korel rif.

Long sam kes, ful bed blong si gras i lus from populesen blong si ejen i kam bigwan tumas kwiktaem mo olgeta i kakae tumas long ol si gras. Ol si ejen namba blong olgeta i kam bigwan olsem from ol fisa i kasem tumas blong ol sanpepafis we oli kakae o si ejen.

Ol korel oli stap helti from ol fis we oli kakae ol plant oli blokem ol bigfala nalumblum blong no tekem ples blong ol korel long rif. Long sam kes fasin we o nalumblum i stap gru hemi kam wan problem taem ol

## ► Fising we i agensem loa

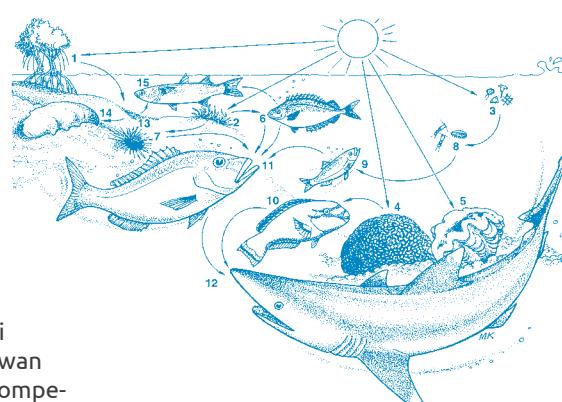
Long Pasifik ol sip blong fising we i blong ol man we i no man ples, ol man blong aotsaed, oli stap fising blong tekem ol fis we i laef, si-kukamba, troka mo bigfala natalae. Fising we i agensem loa hemi mekem plante damej from oli no respektem ol nasonal mo lokol rul long saed blong fising.

Komiuniti oli sud ripotem evri kes blong fising we i agensem loa long otoriti blong gavman.

Olgeta fising komiuniti i mas banem yus blong tul blong pulum win andanit long solwota blong fising wetem.

Fisa i kasem tumas blong ol fis we oli kakae ol plant, olsem blufis, yunikon fis mo potketnaef fis.

Plante problem we oli no problem blong fiseris oli gat bigfala ifek long ecosistem blong solwota mo long namba blong fis we i stap; ol problem i olsem: tekem bak graon aot long solwota mo yusum baken, ol sedimen we i kamaot long graon mo go daon long solwota, eutrophication mo poliusern. Hemia i minim se yumi i mas lukluk blong manejem ol fiseris long wan wei we i mo big, i no blong lukaotem ol fis nomo. Sem taem we yumi stap kontrolem ol rabis fasin blong fising mo ol fasin blong fising we i kasem tumas fis wan taem, yumi i mas tekem aksen blong protektem ol natongtong, ol bed blong si gras, ol korel rif – olgeta ol ples we oli fis oli dipen long olgeta. Fasin blong manejem ia we i mo big oli tokbaot long liflet blong SPC we oli kolem Komiuniti risos manejem.



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Gaed mo ol toksave ia SPC ([www.spc.int](http://www.spc.int)) i wok tugeta wetem LMMA ([www.lmannetwork.org](http://www.lmannetwork.org)) blong produsum blong helpem ol pipol we oli wok wetem ol fising komiuniti blong givim advaes long ol defren mo gud fiseris manejmen opsons.

Paplikeson ia ikam tru long faenansol sapot blong European Union. Printing blong hem I tru long faenansol sapot blong Australian Senta Blong Intanasonal Akrikalja Risej (ACIAR) projekt Improving Komiuniti-bes Fiseris Manejmen long Pasifik Aelan Kaontris FIS/2012/074. Ol vius insaed long paplikeson ia hemi no neseserili riflektem ol vius blong European Union o ACIAR.

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Gaed mo liflets

Pepa blong toksave

2017

# Yumi faenem i had blong kasem olgeta fish

I gat wan problem wetem  
olgeta marin risos blong yumi?

Olgeta marin risos blong yumi  
oli provaedem kakae mo mane long haos blong yumi.  
Plante komiuniti oli ovahavestem olgeta marin risos blong olgeta.  
Olsem wanem long yumi?

Yumi no stap katjem tumas?

Naoia yumi stap katjem olgeta smol  
saes nomo from ating i no moa gat  
olgeta bigfala wan?

BIGFALA RISEN BLONG YUMI NO  
STAP KATJEM TUMAS OLSEM  
BIFO I INKLUDIM:

- Plante moa man oli fishing mo katjem plante fish tumas
- Yus blong ol niu o tul blong fising we i tabu blong kasem ol smol fis o we i mekem i isi tumas
- Katjem olgeta fish bifo oli putum olgeta ek
- Fasin blong spolem olgeta eria we oli impoten long olgeta fish olsem korel, gras we i gro long solwota mo olgeta natongtong
- Olgeta aktiviti we i stap tekem ples long graon olsem loging o faming we i save spolem solwota olsem tru long olgeta riva mo wota we i ron go lo solwota taem i rein.

## OLSEM WANEM NAO YUMI SAVE STAT?

Yumi shud toktok raon insaed long komiuniti blong faenemaot sipos i gat saen se olgeta man oli stap fishing ova tumas. Sipos i tru wanem yumi save MEKEM NAOIA? Olsem wanem nao long olgeta rul blong raet?

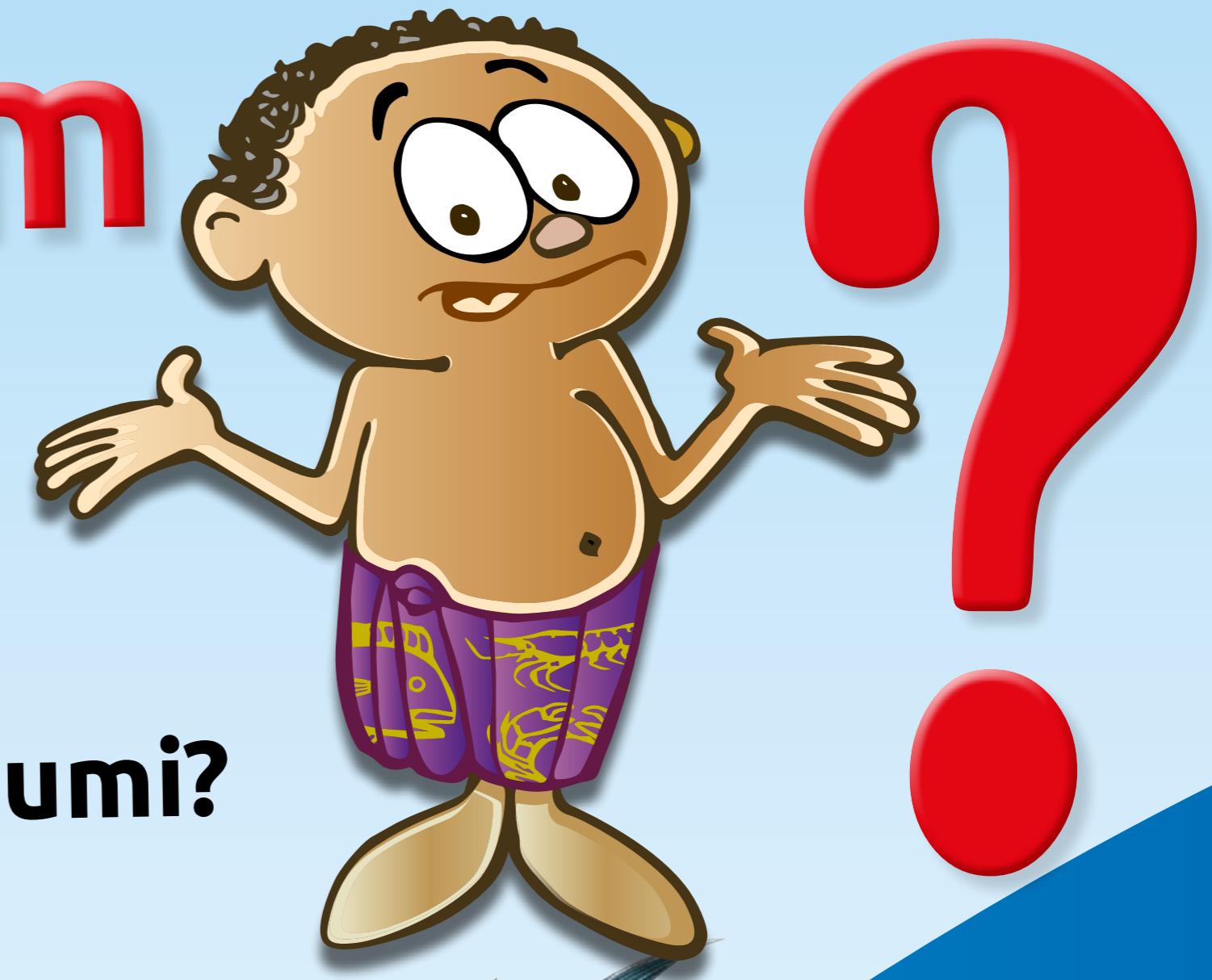
Yumi mas tekem evriwan long komiuniti blong oli tekpat.

Yumi nid blong blong mekem olgeta nrafala man blong oli save long nid ia blong manejem mo protektem olgeta marin risos mo impoten marin habitat blong yumi. Yumi save serem olgeta posta ia mo olgeta nrafala infomeisen long olgta klinik, skul, jej mo olgeta nrafala ples we i gat ol pipol long hem. Yumi save toktok raon long olgeta komon problem – olsem olgeta intaviu long radio mo long olgeta publik miting. Yumi save askem help tu long olgeta nafonal otoriti o olgeta NGO.

Namba wan manejmen blong  
olgeta marin risos (inkludim  
olgeta natongtong, lagoon mo  
korel rif) hemi blong yumi  
wok tueta mo mekem  
samting i hapen!



I gat plante nrafala aksen we yumi save tekem. I no evri aksen we oli tokbaot antap ia oli stret blong man i yusum long evri kaen animal long solwota. SPC (www.spc.int) mo LMMA (www.lmmanetwork.org) i bin mekem plante long olgeta infomeisen pepa blong man i save ridim we oli stap naoia. Man i mas gat konsaltesen long olgeta wanwan infomeisen pepa ia blong save luk wanem manejmen opsen nao hemi save tekem long wanwan long olgeta difren kaen animal blong solwota.



I had blong faenem  
komesol impoten  
marin animol?

## YUMI MAS MEKEM I HAPEN NAOIA BIFO HEMI LEIT TUMAS

Fasin we i lukim i nogat inaf fish i hapen from se man hemi mekem – hemia nao i mekem se yumi mas manejem olgeta risos blong yumi long solwota. Yumi nid blong gat olgeta loa blong protektem laef blong olgeta samting we oli stap long solwota mo olgeta ples we oli stap long hem. Olgeta otoriti blong Nasional fisheris oli putum olgeta rul blong help blong kipim impoten kakae ia mo mane long kam insaed mo yumi mas sapotem olgeta. Wan marin ekosistem we hemi damej hemi had blong oli mekem i kam gud bakegen.

### LOKOL KOMIUNITI I SAVE MEKEM SAM LONG OLGETA RUL.

#### YUMI SAVE:

- Protektem olgeta fish we oli stap kakae olgeta plant**  
Olgeta fish olsem parrotfish, yunikonfish mo sejenfish oli kakae olgeta siwid we oli stap gro long olgeta korel rif.
- Protektem olgeta wotashed eria**  
Askem help blong gavman blong blong katem daon wota blong wasemaot olgeta sedimen mo nutrient long graon: hemia hemi mekem damej long plante ples we olgeta marin animol oli sstop long hem.
- Protektem olgeta ples we olgeta animol oli stap long hem**  
Evri kaen animol oli nidim ples blong kakae, liv mo gro long hem. Sam long olgeta animol oli yusum difren ples blong staph long olgeta difren pat blong laef. Olgeta impoten ples blong staph olsem korel rif, gras blong solwota mo olgeta natongtong.
- Legovolgeta fish we oli stap silip.**  
Stopem man blong daeva long naet taem olgeta fish oli stap silip.
- Stopem olgeta wei blong fishing we oli stap mekem olgeta damej.**  
Olgeta man we oli yusum poisen mo daenamaet oli stap damejem olgeta korel rif mo marin laef we i dipen long olgeta.
- Livim olgeta smolsmol fish mo shel i stap**  
Alaoem wanwan long olgea fish blong oli putum ek festaem bifo man i save kasem olgeta.
- Livim sam long olgeta bigfala fish mo shel i stap**  
Wanwan long olgeta bigfala animol oli mekem plante ek. Protektem o livim sam long olgeta bigfala fish i stap blong oli save kontinu blong riprodus mo provaedem fish blong yumi save kasem olgeta.
- Setemap olgeta ples we bambae man i no save tekem olgeta fish long hem**  
Setemap olgeta eria blong protektem olgeta ples we olgeta fish oli liv long hem (korel rif, gras blong solwota mo olgeta natongtong). Olgeta eria we oli stopem man blong no tekem olgeta fish long hem oli save mekem se hemi impruvum ples we oli stap katjem fish long hem.
- Stopem o katem daon fasin blong man i kasem fish we i putum ek**  
Stopem man blong fishing samtaem long olgeta eria we man i save se fish i stap putum ek long hem.
- Stopem man blong fishing wetem smolsmol net**  
Kontrolem saes blong olgeta net we man i yusum blong katjem fish wetem. Katem daon namba blong olgeta trap blong fish o fenis blong olgeta fish.



I gat plante nrafala aksen we yumi save tekem. I no evri aksen we oli tokbaot antap ia oli stret blong man i yusum long evri kaen animal long solwota. SPC (www.spc.int) mo LMMA (www.lmmanetwork.org) i bin mekem plante long olgeta infomeisen pepa blong man i save ridim we oli stap naoia. Man i mas gat konsaltesen long olgeta wanwan infomeisen pepa ia blong save luk wanem manejmen opsen nao hemi save tekem long wanwan long olgeta difren kaen animal blong solwota.



EUROPEAN UNION



The Locally Managed Marine Area (LMMA) Network

Improving the practice of marine conservation

Australian Aid

Wanem bae happen spos  
yumi lusum olgeta

# gras blong solwota ?



## SAPOS I NOGAT OLGETA GRAS BLONG SOLWOTA BAMBAE SAM FISH MO SHEL OLI NOGAT PLES BLONG HAED MO STAP LONG HEM

Olgeta gras blong solwota oli provaedem ples blong neseri blong olgeta fish we plante long olgeta pikinini blong plante marin animol oli liv mo gro long hem bifo oli kam bigwan mo muv aot go long difren ples.

## SAPOS I NOGAT OLGETA GRAS BLONG SOLWOTA BAMBAE SAM FISH MO SHEL OLI NOGAT KAKAE

Olgeta grin totel, kaofish, mo sam fish oli kakae gras blong solwota. Olgeta liv blong gras blong solwota oli foldaon mo oli roten mo oli fomem toti – materiol we i stap olsem kakae blong plante long olgeta animol oli save kakae.

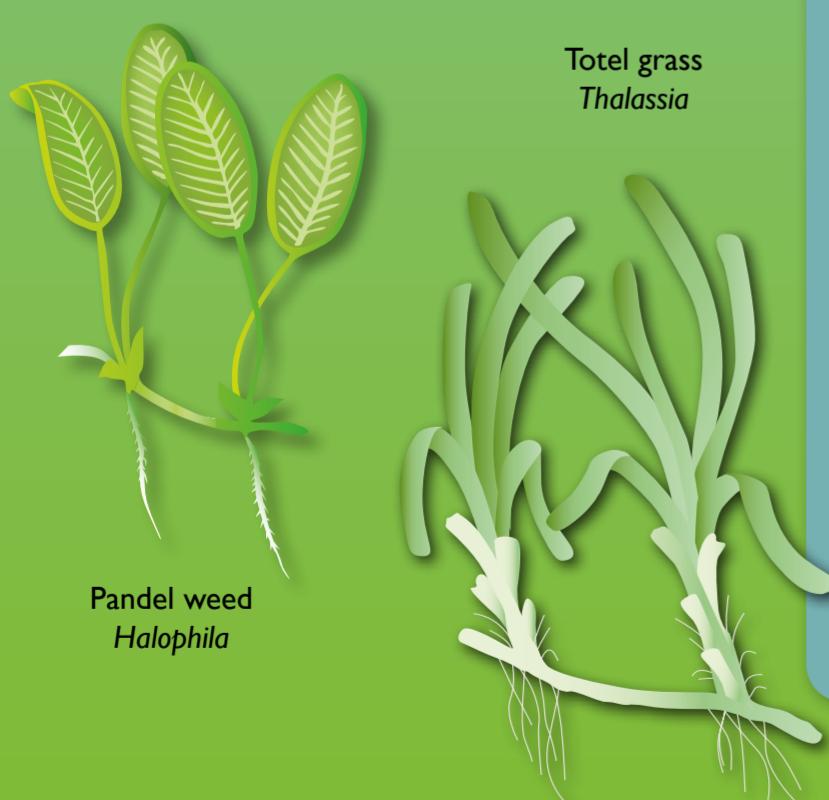
## SAPOS I NOGAT OLGETA NATONGTONG BAMBAE I NOGAT PROTEKSEN LONG ERIA KOLOSAP LONG SOLWOTA

From se olgeta oli trapem olgeta sedimen, i mekem se gras blong solwota oli gro go kasem sho mo protektem eria long solwota mo olgeta wev mo erosen.

## SAPOS I NOGAT OLGETA GRAS BLONG SOLWOTA BAMBAE OLGETA KOREL RIF BLONG YUMI OLI STAP LONG DENJA

Olgeta gras blong solwota oli trapem olgeta sedimen we oli save kilim olgeta korel rif.

## Wanem ia olgeta GRAS BLONG SOLWOTA?



Gras blong solwota i gat liv we if as wetem stamba mo hemi gro flat.. liv blong hem i longfala mo i olsem gras be oli bigwan tugeta olsem long pikja we u save luk long lef saed.

Gras blong solwota i gro long ples we i no dip, evri taem hemi stap taem solwota i drae long rif mo long lagoon mo bitwin tatet mo ples we i sofmat lebet.

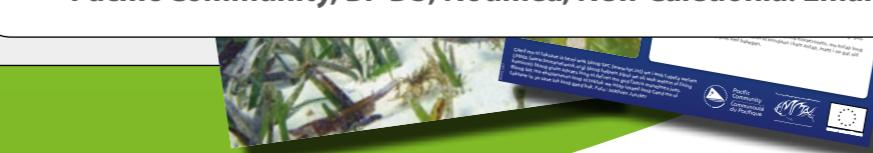
Helti gras blong solwota i save mekem wan bigfala eria blong grin ples we i stap andanit long solwota.



SPC ([www.spc.int](http://www.spc.int)) mo LMMA ([www.lmmanetwork.org](http://www.lmmanetwork.org)) i bin mekem plante long olgeta infomeisen pepa blong man i save ridim, we i inkludim wanwan pepa we i toktok olgeta gras blong solwota. Infomeisen pepa ia i givim list blong olgeta aksen yumi save tekem blong protektem mo manejem gras blong solwota.

Blong save moa infomeisen, o blong karem kopi blong posta ia mo SPC/LMMA Infomeisen kit blong fishing blong olgeta komuniti, kontaktem:

Vanuatu Fisheries Department, PMB 9045, Port Vila, Vanuatu. Phone: 5333340  
Pacific Community, BP D5, Noumea, New Caledonia. Email: [spc@spc.int](mailto:spc@spc.int)



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The Locally-Managed Marine Areas (LMMA) Network



Wanem bae hapen  
sipos yumi lusum olgeta

# Natongtong

blong yumi?



## SAPOS I NOGAT OLGETA NATONGTONG BAMBAE SAM FISH MO SHEL OLI NOGAT PLES BLONG HAED MO STAP LONG HEM

Olgeta natongtong oli provaedem ples blong neseri blong olgeta fish we plante long olgeta pikinini blong plante marin animol oli liv mo gro long hem bifo oli kam bigwan mo muv aot go long difren ples.

## SAPOS I NOGAT OLGETA NATONGTONG BAMBAE SAM FISH MO SHEL OLI NOGAT KAKAE

Olgeta nutrien oli lus long olgeta wota we i ron kam daon long graon mo olgeta natongtong oli tekem mo yusum. Olgeta liv blong natongtong oli foldaon mo oli roten mo oli fomem toti – materiol we i stap olsem kakae blong plante long olgeta animol oli save kakae. Olgeta smolsmol animol ia oli provaedem kake blong olgeta bigfala fish.

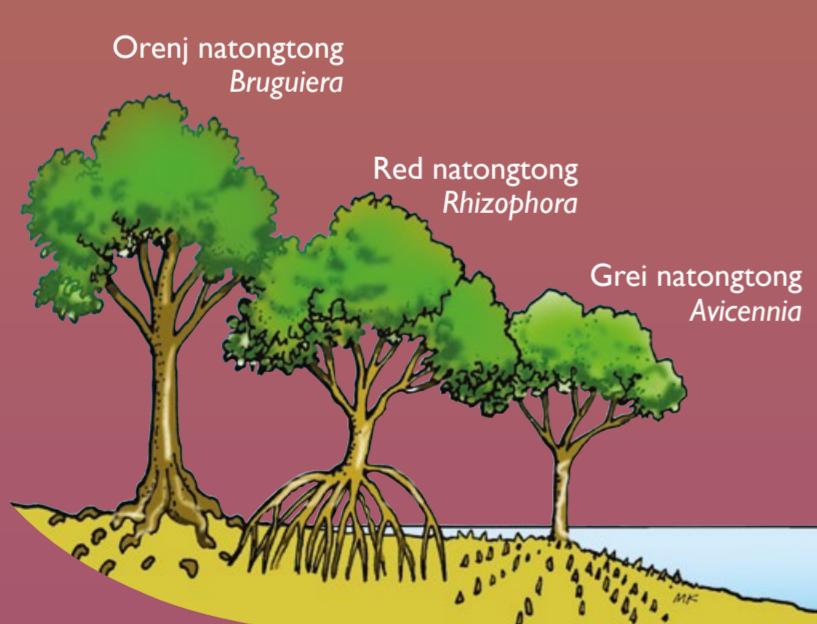
## SAPOS I NOGAT OLGETA NATONGTONG BAMBAE I NOGAT PROTEKSEN LONG ERIA KOLOSAP LONG SOLWOTA

Olgeta ruts blong natongtong we oli kamaot oli trapem olgeta patikol mo sedimen we sloslo oli bildap mo protektem eria lo solwota long olgeta wev mo erosen, mo tu strong win mo saeklon we naoia oli stap kam moa strong folet weta blong yumi we i stap jenis.

## SAPOS I NOGAT OLGETA NATONGTONG BAMBAE OLGETA KOREL RIF BLONG YUMI OLI STAP LONG DENJA

Olgeta natongtong oli gud blong trapem olgeta stiki klam blong sedimen we i miks wetem olgeta nutrien (oli kolem flocs) we i save kilim olgeta smolsmol korel rif

## Wanem ia NATONGTONG?



Samples long eiti (80) difren tri oli stap long saedsaed blong solwota oli kolem olgeta natongtong.

Plante long olgeta natongtong oli groem ruts aotsaed we man i save luk klia nomo, we olgeta ruts ia oli tekem oxygen mo semtaem sapotem tri. Orenj natongtong i gat olgeta ruts we oli kasem haet blong ni, red natongtong i gat longfala ruts we i gro daon long stamba, mo grei natongtong i gat olgeta ruts olsem olgeta kebol, we bae u luk smolsmol samting oli stikaot long hem o oli kolem pneumatophores.



SPC ([www.spc.int](http://www.spc.int)) mo LMMA ([www.lmmnetwork.org](http://www.lmmnetwork.org)) i bin mekem plante long olgeta infomeisen pepa blong man i save ridim, we i inkludim wanwan pepa we i toktok olgeta gras blong solwota. Infomeisen pepa ia i givim list blong olgeta aksen yumi save tekem blong protektem mo manejem gras blong solwota.

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Pacific Community  
Communauté du Pacifique



SPREP  
Secretariat of the Pacific Regional Environment Programme



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