BIBLE OF THE ISLANDS

Expert System

Lucas Wyte

11 IPT

August 1995

BIBLE OF THE ISLANDS

Expert System

PROBLEM DEFINITION AND SOLUTION SPECIFICATION

Queensland's Great Barrier Reef is one of the most magical, beautiful wonders of the world. In particular, the Whitsundays offers to the boatie or yachtie some of the most exquisite islands, best anchorages, diving locations, camping sites and resorts. The *Bible of the Islands* Expert System was an easy choice of topic as my family and I have often spent many days and nights sailing around the beautiful blue waters of the Whitsundays and its surrounds. We have found that any party wishing to explore this magic region should have a general idea of where to go (safe anchorages, diving spots, etc.) before departing on such an adventure. Extra information such as cyclone anchorages can also prove to be helpful if such an emergency arises.

Eshell, an knowledge engineering tool by T. Dwyer, is the program that shall be used in the creation and implementation of the *Bible of the Islands*. In the Expert System, the user will be prompted to respond to questions such as what type of anchorage they are seeking, what the wind's direction is, whether they are looking for diving spots, etc, and what the user's location is. The Expert System will reply by displaying a suitable island for anchorage, which was selected by the user's circumstances. The material used for the creation of the *Bible of the Islands* has been gathered from the current printed 'bible', *100 Magic Miles of the Great Barrier Reef*, by David Colfelt. This information was then used to formulate the Expert System's decision tree and attribute table.

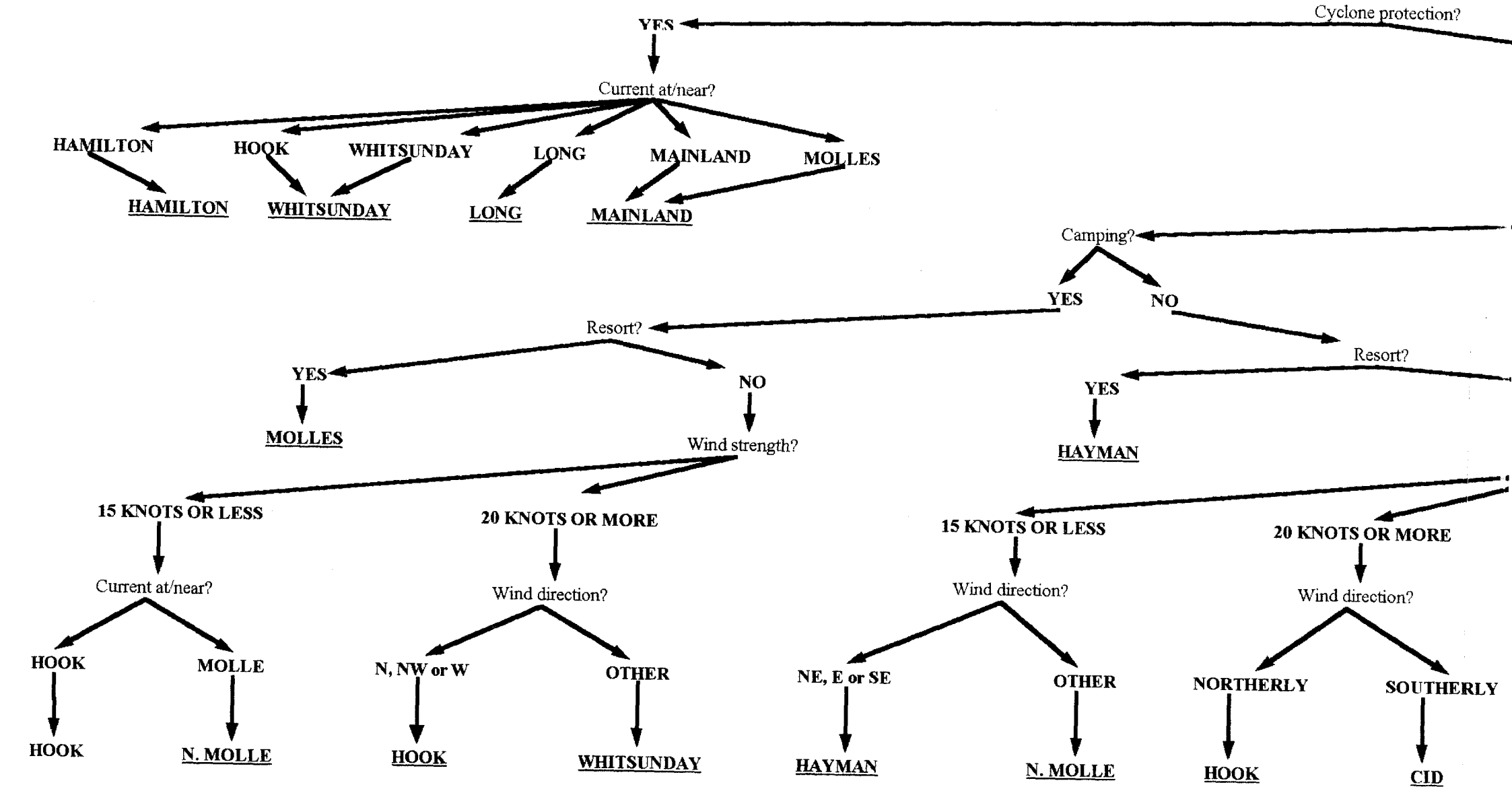
The *Bible of the Islands* Expert System is designed to be used by the charter yachtie or boatie in determining a suitable island to anchor. The user should have general boating knowledge and an understanding of the Whitsundays, as the *Bible of the Islands* is not a boating manual nor a navigational map. This program is, however, designed to be used "in the field" - on the boat and on the water, where the information is undoubtedly most valuable. It is aimed to cover the most popular and reputable islands in the Central Whitsundays Group, from Hayman to Hamilton Island. It will offer a suitable island to consider for anchorage as well as information on diving potential, hazards, etc. Further information on the bays and inlets of the island may then be sought from the traditional, paper 'bible'.

The most valuable feature of the *Bible of the Islands* Expert System is that it will be so easy to use; no navigational or mapping experience is required to find the most suitable island for the user from the many to choose from. All the user should need to know is what they're looking for and where they are - easy !!?! The *Bible of the Islands* will be self-explanatory, with useful help screens that detail everything the user needs to get the program up and running, and a brief description of what to expect when they press the enter key.

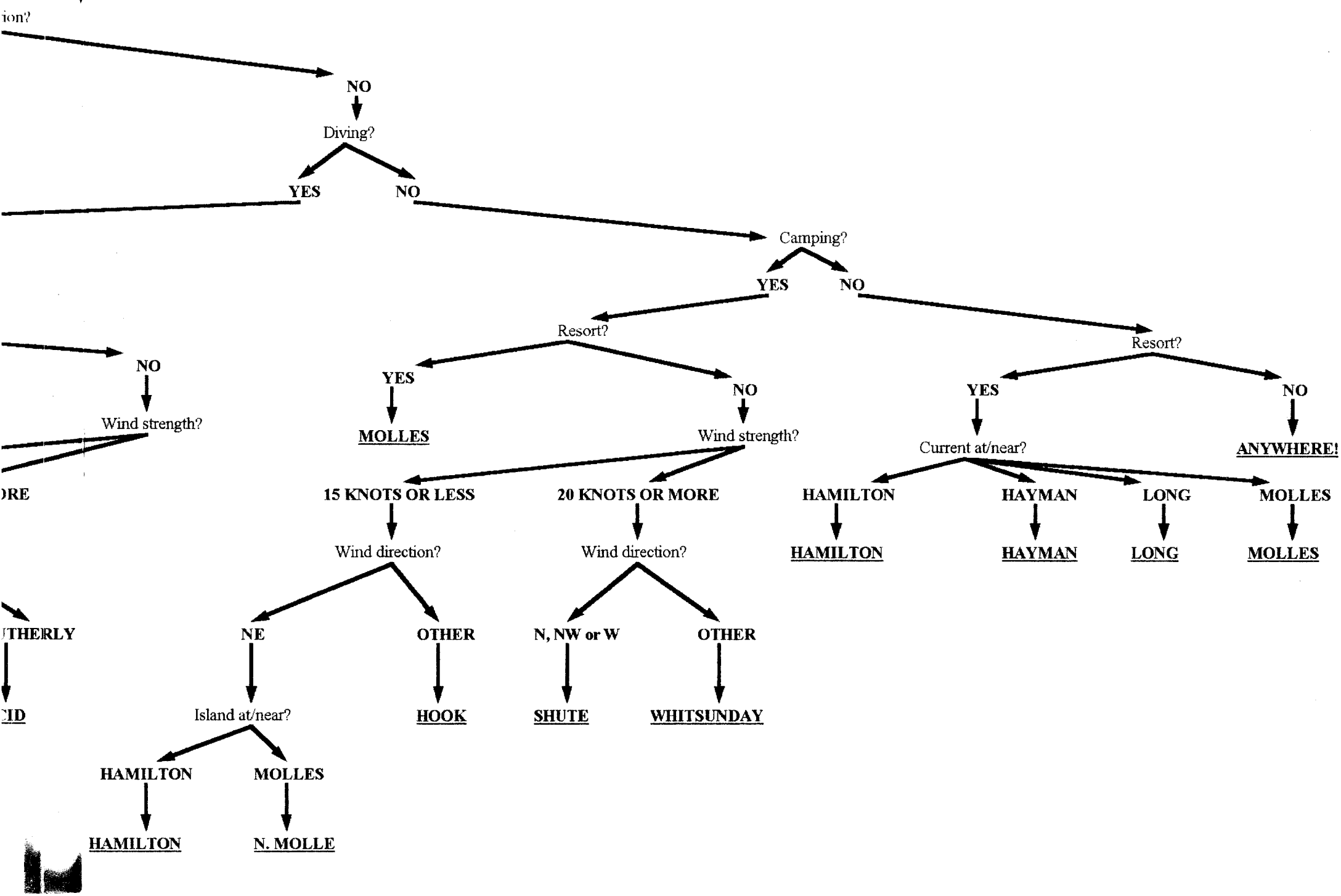
ATTRIBUTES							CONCL			
CYCLONE PROTECTION	DIVING	CAMPING	RESORT	WIND STRENGTH	WIND DIRECTION	CURRENT AT/NEAR	ISLAND	SUGGEST. ANCHORAGE	HAZARD	DI POTI
Yes						Hamilton Island	Hamilton Island	Hamilton Harbour		
Yes						Hook Island	Whitsunday Island	Upper Gulnare Inlet		
Yes						Long Island	Long Island	Woodcutter Bay		
Yes						Mainland	Mainland	Trammel Bay		
Yes						Molle Islands	Mainland	Trammel Bay		
Yes						Whitsunday Island	Whitsunday Island	Upper Gulnare Inlet		
No	Yes	Yes	Yes				Molle Islands		Unsafe passages	G
No	Yes	Yes	No	15 knots or less		Hook Island	Hook Island	Nara Inlet	Deceptive reef	G
No	Yes	Yes	No	!5 knots or less		Molle Islands	North Molle Island	Hannah Point		G
No	Yes	Yes	No	20 knots or more	N, NW or W		Hook Island	The Pinnacles	Strong currents	Exc
No	Yes	Yes	No	20 knots or more	Other		Whitsunday Island	Sawmill Beach	A strong current	Good a
No	Yes	No	Yes				Hayman Island	Blue Pearl Bay		Exc
No	Yes	No	No	15 knots or less	NE, E or SE		Hayman Island	Blue Pearl Bay		Exc
No	Yes	No	No	15 knots or less	Other		North Molle Island	Hannah Point		G
No	Yes	No	No	20 knots or more	Northerly		Hook Island	The Pinnacles	Strong currents	Exc
No	Yes	No	No	20 knots or more	Southerly		Cid Island		A strong current	Good a
No	No	Yes	Yes				Molle Islands		Unsafe passages	
No	No	Yes	No	15 knots or less	NE	Hamilton Island	Henning Island	North Spit	Bareboats beware!	
No	No	Yes	No	15 knots or less	NE	Molle Islands	North Molle Island	North West Beach		
No	No	Yes	No	15 knots or less	Other		Hook Island	Observatory	Flukey winds	
No	No	Yes	No	20knots or more	N, NW or W		Shute Island	North West Beach	Eddies	
No	No	Yes	No	20 knots or more	Other		Whitsunday Island	Sawmill Bay	A strong current	
No	No	No	Yes			Hamilton Island	Hamilton Island		Restricted areas	
No	No	No	Yes			Hayman Island	Hayman Island		Fringing reefs	
No	No	No	Yes			Long Island	Long Island		A strong current	
No	No	No	Yes			Molle Islands	Molle Islands		Unsafe passages	
No	No	No	No				ANYWHERE !!!			

CONCLUSIONS

SUGGEST. ANCHORAGE	HAZARD	DIVING POTENTIAL	CAMP FACILITIES	"MAGIC MILES" REF.
Hamilton Harbour				C12-13
Upper Gulnare Inlet				C20
Woodcutter Bay				C6
Trammel Bay				C5
Trammel Bay				C5
Upper Gulnare Inlet				C20
	Unsafe passages	Good	Available	C9
Nara Inlet	Deceptive reef	Good	Not Available	C10
Hannah Point		Good	Available	C8
The Pinnacles	Strong currents	Excellent	Not Available	C15
Sawmill Beach	A strong current	Good at Ross It.	Available	C19
Blue Pearl Bay		Excellent		C12
Blue Pearl Bay		Excellent		C12
Hannah Point		Good		C8
The Pinnacles	Strong currents	Excellent		C15
	A strong current	Good at Ross It.		C19
	Unsafe passages		Available	C9
North Spit	Bareboats beware!		Not Available	C20
North West Beach			Available	C8
Observatory	Flukey winds		Available	C17
North West Beach	Eddies		Available	C3
Sawmill Bay	A strong current		Available	C19
	Restricted areas			C22
	Fringing reefs			C12
	A strong current			C4
	Unsafe passages			C9
				pages 170-221



DECISION TREE


ion?
NO
Diving?
YES
NO
Camping?
YES
NO
Resort?
YES
NO
MOLLES
Wind strength?
15 KNOTS OR LESS
20 KNOTS OR MORE
Wind direction?
Wind direction?
NE
OTHER
N, NW or W
OTHER
Island at/near?
HOOK
SHUTE
WHITSUNDAY
HAMILTON
MOLLES
HAMILTON
N. MOLLE
NO
Wind strength?
ORE
UTHERLY
CID
Resort?
YES
NO
Current at/near?
ANYWHERE!
HAMILTON
HAYMAN
LONG
MOLLES
HAMILTON
HAYMAN
LONG
MOLLES

BIBLE OF THE ISLANDS
Expert System

Expert System: A:\BIBLE.EXP

Number of attributes:	7
Number of conclusions:	6
Number of rules:	27

LIST OF ATTRIBUTES WITH DESCRIPTIONS

1	Attribute name:	**CYCLONE PROTECTION**
	Description:	Do you require a cyclone protected anchorage?
2	Attribute name:	**DIVING**
	Description:	Are you looking for a reputable diving site?
3	Attribute name:	**CAMPING**
	Description:	Do you seek an anchorage with a camping site nearby?
4	Attribute name:	**RESORT**
	Description:	Are you looking for a commercial resort?
5	Attribute name:	**WIND STRENGTH**
	Description:	What is the wind's strength?
6	Attribute name:	**WIND DIRECTION**
	Description:	What is the wind's direction?
7	Attribute name:	**CURRENTLY AT/NEAR**
	Description:	Where are you currently located (or near)?

LIST OF CONCLUSIONS WITH DESCRIPTIONS

1	Conclusion name:	**A suitable island**
	Description:	The most suitable island for you.
2	Conclusion name:	**Suggest. anchorage**
	Description:	A reputable anchorage.
3	Conclusion name:	**Hazard**
	Description:	Hazards you should be aware of.
4	Conclusion name:	**Diving potential**
	Description:	The diving potential at (or near) the anchorage.
5	Conclusion name:	**Camping facility**
	Description:	The availability of facilities at the camp site.
6	Conclusion name:	**"Magic Miles" ref.**
	Description:	The traditional "bible" map reference.

LIST OF RULES

RULE 1
IF
CYCLONE PROTECTION = Yes
DIVING = null
CAMPING = null
RESORT = null
WIND STRENGTH = null
WIND DIRECTION = null
CURRENTLY AT/NEAR = Hamilton Island
THEN
A suitable island is Hamilton Island
Suggest. anchorage is Hamilton Harbour
Hazard is null
Diving potential is null
Camping facility is null
"Magic Miles" ref. is C12-13

RULE 2
IF
CYCLONE PROTECTION = Yes
DIVING = null
CAMPING = null
RESORT = null
WIND STRENGTH = null
WIND DIRECTION = null
CURRENTLY AT/NEAR = Hook Island
THEN
A suitable island is Whitsunday Island
Suggest. anchorage is Upper Gulnare Inlt
Hazard is null
Diving potential is null
Camping facility is null
"Magic Miles" ref. is C20

RULE 3
IF
CYCLONE PROTECTION = Yes
DIVING = null
CAMPING = null
RESORT = null
WIND STRENGTH = null
WIND DIRECTION = null
CURRENTLY AT/NEAR = Long Island
THEN
A suitable island is Long Island
Suggest. anchorage is Woodcutter Bay
Hazard is null
Diving potential is null
Camping facility is null
"Magic Miles" ref. is C6

RULE 4
IF
CYCLONE PROTECTION = Yes
DIVING = null
CAMPING = null
RESORT = null
WIND STRENGTH = null
WIND DIRECTION = null
CURRENTLY AT/NEAR = Mainland
THEN
A suitable island is Mainland
Suggest. anchorage is Trammel Bay
Hazard is null
Diving potential is null
Camping facility is null
"Magic Miles" ref. is C5

RULE 5
IF
CYCLONE PROTECTION = Yes
DIVING = null
CAMPING = null
RESORT = null
WIND STRENGTH = null
WIND DIRECTION = null
CURRENTLY AT/NEAR = Molle Islands
THEN
A suitable island is Mainland
Suggest. anchorage is Trammel Bay
Hazard is null
Diving potential is null
Camping facility is null
"Magic Miles" ref. is C5

RULE 6
IF
CYCLONE PROTECTION = Yes
DIVING = null
CAMPING = null
RESORT = null
WIND STRENGTH = null
WIND DIRECTION = null
CURRENTLY AT/NEAR = Whitsunday Island
THEN
A suitable island is Whitsunday Island
Suggest. anchorage is Upper Gulnare Inlt
Hazard is null
Diving potential is null
Camping facility is null
"Magic Miles" ref. is C20

RULE 7
IF
CYCLONE PROTECTION = No
DIVING = Yes
CAMPING = Yes
RESORT = Yes
WIND STRENGTH = null
WIND DIRECTION = null
CURRENTLY AT/NEAR = null
THEN
A suitable island is Molle Islands
Suggest. anchorage is null
Hazard is unsafe passages
Diving potential is good
Camping facility is available
"Magic Miles" ref. is C9

RULE 8
IF
CYCLONE PROTECTION = No
DIVING = Yes
CAMPING = Yes
RESORT = No
WIND STRENGTH = 15 knots or less
WIND DIRECTION = null
CURRENTLY AT/NEAR = Hook Island
THEN
A suitable island is Hook Island
Suggest. anchorage is Nara Inlet
Hazard is deceptive reef
Diving potential is good
Camping facility is available
"Magic Miles" ref. is C10

RULE 9
IF
CYCLONE PROTECTION = No
DIVING = Yes
CAMPING = Yes
RESORT = No
WIND STRENGTH = 15 knots or less
WIND DIRECTION = null
CURRENTLY AT/NEAR = Molle Islands
THEN
A suitable island is North Molle Island
Suggest. anchorage is Hannah Point
Hazard is null
Diving potential is good
Camping facility is available
"Magic Miles" ref. is C8

RULE 10
IF
CYCLONE PROTECTION = No
DIVING = Yes
CAMPING = Yes
RESORT = No
WIND STRENGTH = 20 knots or more
WIND DIRECTION = N, NW or W
CURRENTLY AT/NEAR = null
THEN
A suitable island is Hook Island
Suggest. anchorage is The Pinnacles
Hazard is strong currents
Diving potential is excellent!
Camping facility is not available
"Magic Miles" ref. is C15

RULE 11
IF
CYCLONE PROTECTION = No
DIVING = Yes
CAMPING = Yes
RESORT = No
WIND STRENGTH = 20 knots or more
WIND DIRECTION = Other
CURRENTLY AT/NEAR = null
THEN
A suitable island is Whitsunday Island
Suggest. anchorage is Sawmill Beach
Hazard is a strong current
Diving potential is good at Ross It.
Camping facility is available
"Magic Miles" ref. is C19

RULE 12
IF
CYCLONE PROTECTION = No
DIVING = Yes
CAMPING = No
RESORT = Yes
WIND STRENGTH = null
WIND DIRECTION = null
CURRENTLY AT/NEAR = null
THEN
A suitable island is Hayman Island
Suggest. anchorage is Blue Pearl Bay
Hazard is null
Diving potential is excellent!
Camping facility is null
"Magic Miles" ref. is C12

RULE 13
IF
CYCLONE PROTECTION = No
DIVING = Yes
CAMPING = No
RESORT = No
WIND STRENGTH = 15 knots or less
WIND DIRECTION = NE, E or SE
CURRENTLY AT/NEAR = null
THEN
A suitable island is Hayman Island
Suggest. anchorage is Blue Pearl Bay
Hazard is null
Diving potential is excellent!
Camping facility is null
"Magic Miles" ref. is C12

RULE 14
IF
CYCLONE PROTECTION = No
DIVING = Yes
CAMPING = No
RESORT = No
WIND STRENGTH = 15 knots or less
WIND DIRECTION = Other
CURRENTLY AT/NEAR = null
THEN
A suitable island is North Molle Island
Suggest. anchorage is Hannah Point
Hazard is null
Diving potential is good
Camping facility is null
"Magic Miles" ref. is C8

RULE 15
IF
CYCLONE PROTECTION = No
DIVING = Yes
CAMPING = No
RESORT = No
WIND STRENGTH = 20 knots or more
WIND DIRECTION = Generally north
CURRENTLY AT/NEAR = null
THEN
A suitable island is Hook Island
Suggest. anchorage is The Pinnacles
Hazard is strong currents
Diving potential is excellent!
Camping facility is null
"Magic Miles" ref. is C15

RULE 16
IF
CYCLONE PROTECTION = No
DIVING = Yes
CAMPING = No
RESORT = No
WIND STRENGTH = 20 knots or more
WIND DIRECTION = Generally south
CURRENTLY AT/NEAR = null
THEN
A suitable island is Cid Island
Suggest. anchorage is null
Hazard is a strong current
Diving potential is good at Ross It.
Camping facility is null
"Magic Miles" ref. is C19

RULE 17
IF
CYCLONE PROTECTION = No
DIVING = No
CAMPING = Yes
RESORT = Yes
WIND STRENGTH = null
WIND DIRECTION = null
CURRENTLY AT/NEAR = null
THEN
A suitable island is Molle Islands
Suggest. anchorage is null
Hazard is unsafe passages
Diving potential is null
Camping facility is available
"Magic Miles" ref. is C9

RULE 18
IF
CYCLONE PROTECTION = No
DIVING = No
CAMPING = Yes
RESORT = No
WIND STRENGTH = 15 knots or less
WIND DIRECTION = NE
CURRENTLY AT/NEAR = Hamilton Island
THEN
A suitable island is Henning Island
Suggest. anchorage is North Spit
Hazard is bareboats beware!
Diving potential is null
Camping facility is not available
"Magic Miles" ref. is C20

RULE 19
IF
CYCLONE PROTECTION = No
DIVING = No
CAMPING = Yes
RESORT = No
WIND STRENGTH = 15 knots or less
WIND DIRECTION = NE
CURRENTLY AT/NEAR = Molle Islands
THEN
A suitable island is North Molle Island
Suggest. anchorage is North West Beach
Hazard is null
Diving potential is null
Camping facility is available
"Magic Miles" ref. is C8

RULE 20
IF
CYCLONE PROTECTION = No
DIVING = No
CAMPING = Yes
RESORT = No
WIND STRENGTH = 15 knots or less
WIND DIRECTION = Other
CURRENTLY AT/NEAR = null
THEN
A suitable island is Hook Island
Suggest. anchorage is the Observatory
Hazard is flukey winds
Diving potential is null
Camping facility is available
"Magic Miles" ref. is C17

RULE 21
IF
CYCLONE PROTECTION = No
DIVING = No
CAMPING = Yes
RESORT = No
WIND STRENGTH = 20 knots or more
WIND DIRECTION = N, NW or W
CURRENTLY AT/NEAR = null
THEN
A suitable island is Shute Island
Suggest. anchorage is North West Beach
Hazard is eddies
Diving potential is null
Camping facility is available
"Magic Miles" ref. is C3

RULE 22
IF
CYCLONE PROTECTION = No
DIVING = No
CAMPING = Yes
RESORT = No
WIND STRENGTH = 20 knots or more
WIND DIRECTION = Other
CURRENTLY AT/NEAR = null
THEN
A suitable island is Whitsunday Island
Suggest. anchorage is Sawmill Bay
Hazard is a strong current
Diving potential is null
Camping facility is available
"Magic Miles" ref. is C19

RULE 23
IF
CYCLONE PROTECTION = No
DIVING = No
CAMPING = No
RESORT = Yes
WIND STRENGTH = null
WIND DIRECTION = null
CURRENTLY AT/NEAR = Hamilton Island
THEN
A suitable island is Hamilton Island
Suggest. anchorage is null
Hazard is restricted areas
Diving potential is null
Camping facility is null
"Magic Miles" ref. is C22

RULE 24
IF
CYCLONE PROTECTION = No
DIVING = No
CAMPING = No
RESORT = No
WIND STRENGTH = null
WIND DIRECTION = null
CURRENTLY AT/NEAR = Hayman Island
THEN
A suitable island is Hayman Island
Suggest. anchorage is null
Hazard is fringing reefs
Diving potential is null
Camping facility is null
"Magic Miles" ref. is C12-13

RULE 25
IF
CYCLONE PROTECTION = No
DIVING = No
CAMPING = No
RESORT = Yes
WIND STRENGTH = null
WIND DIRECTION = null
CURRENTLY AT/NEAR = Long Island
THEN
A suitable island is Long Island
Suggest. anchorage is null
Hazard is a strong current
Diving potential is null
Camping facility is null
"Magic Miles" ref. is C4

RULE 26
IF
CYCLONE PROTECTION = No
DIVING = No
CAMPING = No
RESORT = Yes
WIND STRENGTH = null
WIND DIRECTION = null
CURRENTLY AT/NEAR = Molle Islands
THEN
A suitable island is Molle Islands
Suggest. anchorage is null
Hazard is unsafe passages
Diving potential is null
Camping facility is null
"Magic Miles" ref. is C9

RULE 27
IF
CYCLONE PROTECTION = No
DIVING = No
CAMPING = No
RESORT = No
WIND STRENGTH = null
WIND DIRECTION = null
CURRENTLY AT/NEAR = null
THEN
A suitable island is ANYWHERE !!!
Suggest. anchorage is null
Hazard is null
Diving potential is null
Camping facility is null
"Magic Miles" ref. is pages 170 - 221

"BIBLE OF THE ISLANDS"
Expert System 1.0

Created by Lucas Wyte, August 1995.

Queensland's Great Barrier Reef is one of the most magical, beautiful wonders of the world. In particular, the Whitsundays offers to the boatie some of the most exquisite islands, best anchorages, diving locations and camping sites.

The "Bible of the Islands" Expert System is designed to be used by you, the user, in determining a suitable island to anchor. This program will offer you an island to consider, in addition to information such as hazards and diving sites. You need to know nothing about navigation to use this program - just turn it on and go!

Press any key to continue . . .

"Bible of the Islands"
M A I N M E N U

Please select an option from below ....

1. Run the "Bible of the Islands" Expert System.

2. HELP !!

3. Exit to DOS.

PLEASE ENTER YOUR SELECTION>

"Bible of the Islands"
H E L P !

Loading Instructions: (some already completed)

1. Insert "Bible of the Islands" disk in drive A and turn your computer on.
   The "Bible of the Islands" introduction and main menu will then load automatically.

2. Select an option from the main menu. If you have not used this program previously, the 'Help' option is recommended - which is where you are now.
   If you select 'Run the "Bible of the Islands" Expert System', you would follow these instructions ....

(continued)

Press any key to continue . . .

"Bible of the Islands"
H E L P !

TO USE THE "BIBLE OF THE ISLANDS" EXPERT SYSTEM:

1. Once selecting 'Run the "Bible of the Islands" Expert System' from the main menu, EShell will load into the computer's memory. When EShell's main menu appears, select 'Run a Knowledge Base' with the arrow keys or mouse and press enter.

2. A file selection menu will then be displayed. Select the file 'BIBLE.EXP' and press enter.

   The computer will then proceed to load the "Bible's" knowledge base into memory.

(continued)

Press any key to continue . . .

"Bible of the Islands"
H E L P !

3. EShell will then display the "Bible's" first question. Upon answering all the questions, the conclusions will then be displayed. If you wish to run the "Bible of the Islands" again, select 'Run K. Base Again' option.

4. To exit at any stage, repeatedly press escape.

NOTE: For trouble-free use, do not at any stage select 'Edit a Knowledge Base'.

Please enjoy using the "Bible of the Islands" Expert System and remember for more detailed information on the Whitsundays consult the traditional paper 'bible' - "100 Magic Miles of the Great Barrier Reef".

Press any key to continue . . .

"Bible of the Islands"
M A I N M E N U

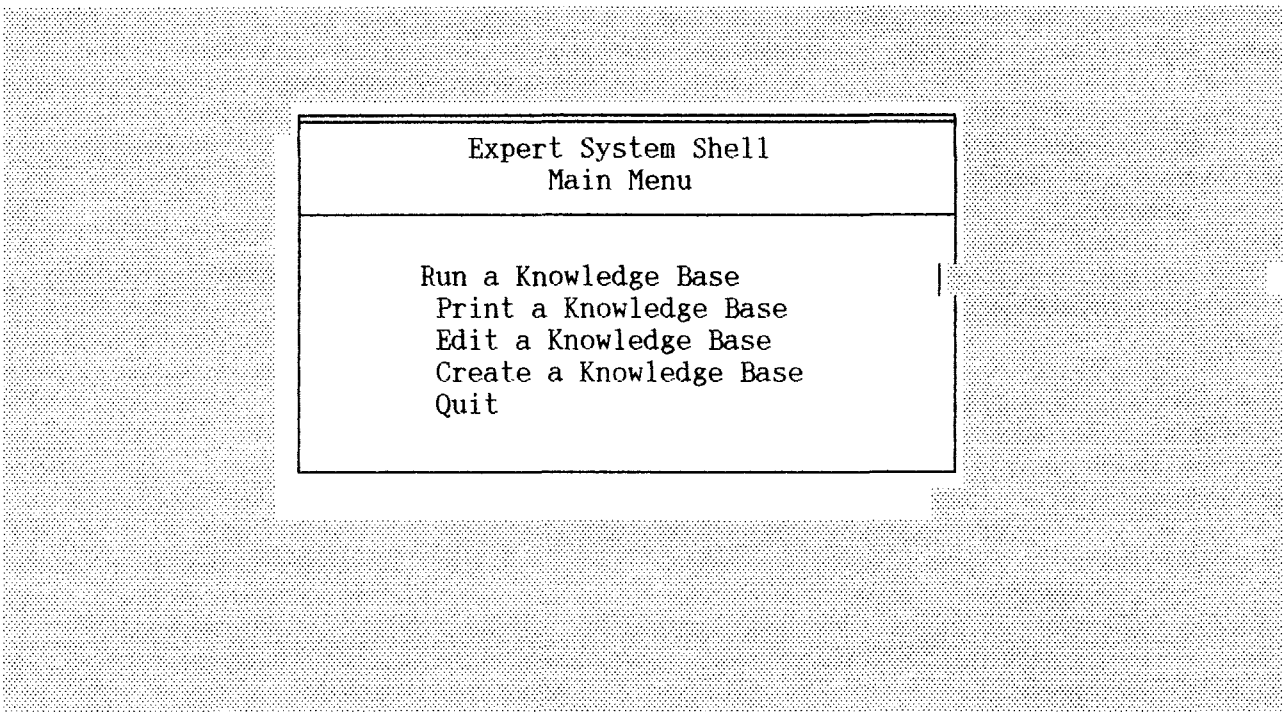
Please select an option from below ....

1. Run the "Bible of the Islands" Expert System.

2. HELP !!

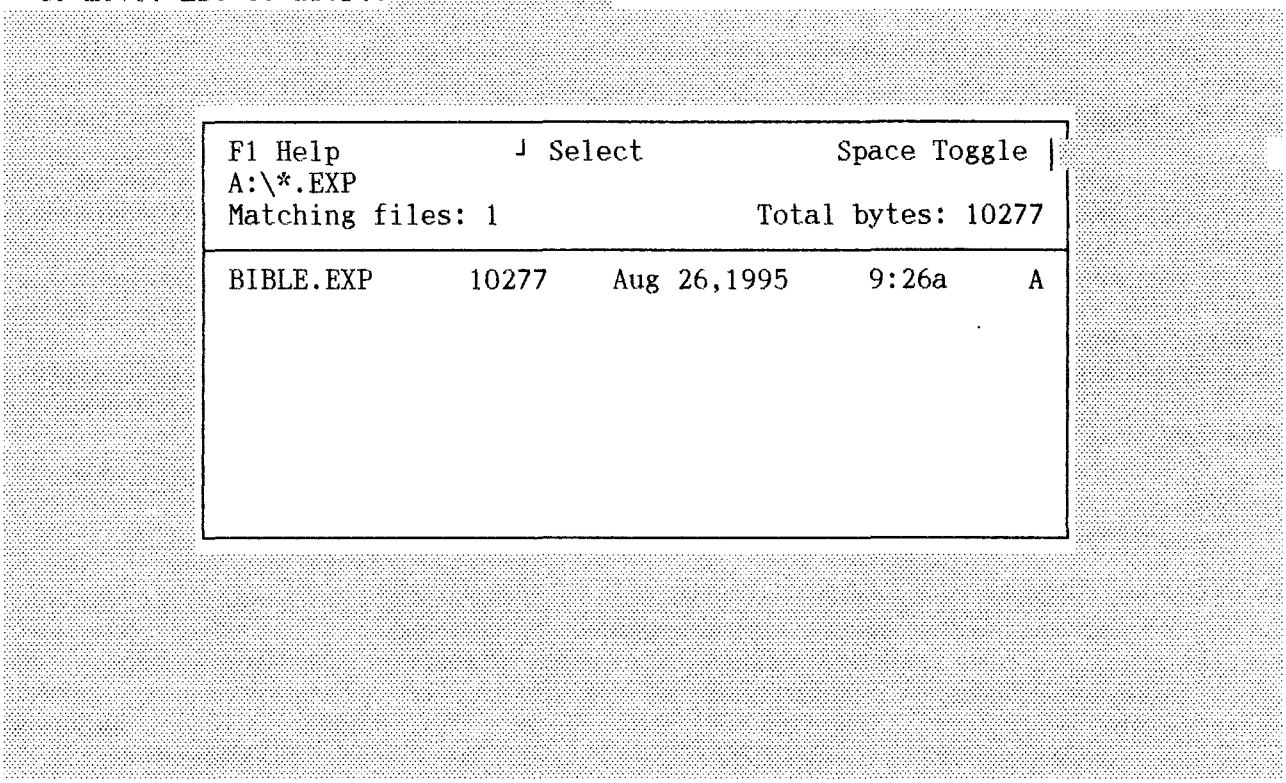
3. Exit to DOS.

PLEASE ENTER YOUR SELECTION>



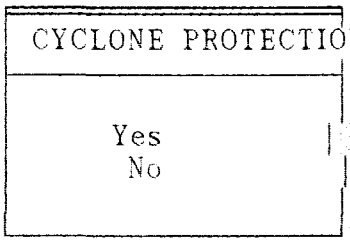
by Terry Dwyer 1993

to move. Esc to abort.



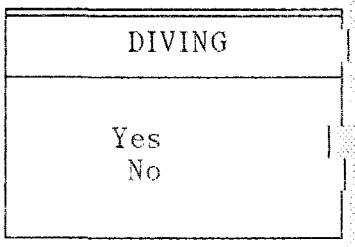
to move. Esc to abort.

Do you require a cyclone protected anchorage?



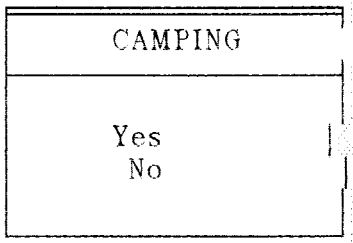
to move. Esc to abort.

Are you looking for a reputable diving site?



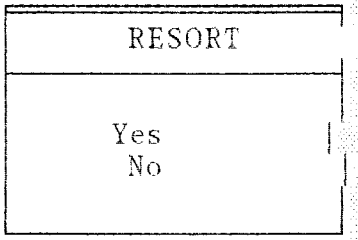
to move. Esc to abort.

Do you seek an anchorage with a camping site nearby?



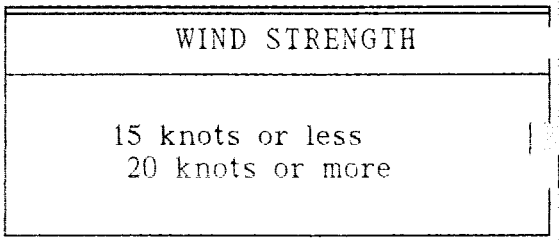
to move. Esc to abort.

Are you looking for a commercial resort?



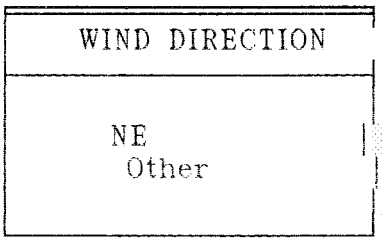
to move. Esc to abort.

What is the wind's strength?



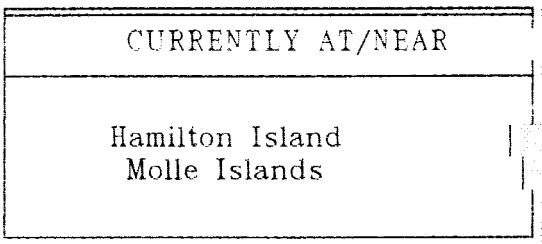
to move. Esc to abort.

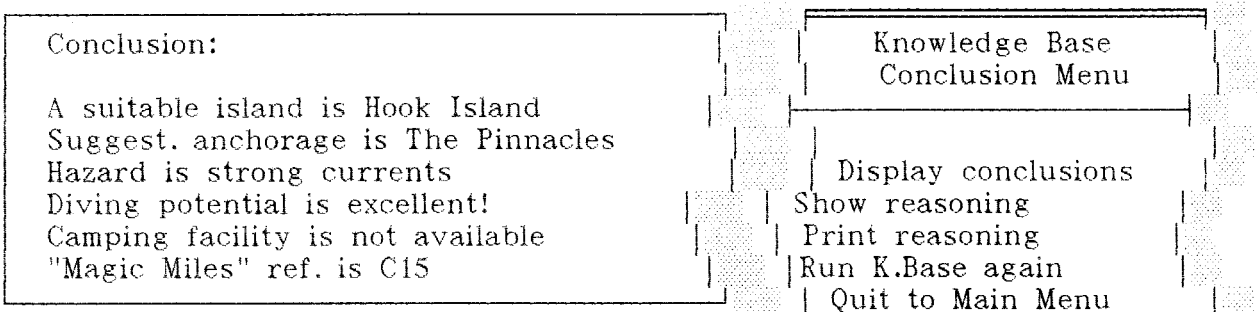
What is the wind's direction?



to move. Esc to abort.

Where are you currently located (or near)?





BIBLE OF THE ISLANDS

Expert System

EVALUATION

To evaluate the "Bible of the Islands" Expert System, I asked Mr Stuart Wolfe, an expert in sailing and the Whitsundays. He has had fifteen years sailing experience and has competed in many races and events including the famous "Whitsunday Fun Race". He has also completed two round trips from Launceston to the Whistundays. In addition, bareboat chartering is a family business for Mr Wolfe, as his uncle owns such a business in the Whitsundays.

Mr Wolfe feels:

> "I foresee that this program could have very real commercial potential as a guide for sailors wishing to cruise in the Whitsundays. It would especially help those who hire a boat and only have a limited time in the Whistundays in determining a suitable island to anchor - yes, it would help them immensely. I find all the knowledge in the "Bible of the Islands" Expert System to be correct and I would like a copy for use on my own home computer."

Mrs Nancy McInnes, a 78 year old pensioner from Sydney, was also asked to evaluate the "Bible of the Islands" Expert System as a non-expert in the field. She has never used a computer before and has little knowledge on boating and the Whitsundays.

Mrs McInnes stated:

> "I think it was absolutely amazing. I never dreamed I could use a computer. I found it very easy to use and the "Bible of the Islands" program very easy to understand. I think this program would be very helpful on boats in the future - making boating much more safe. Being a novice at both sailing and computers, the instructions were most valuable. With the directions of this program, I think I would be able to find the right island for me if ever I went sailing in the Whitusndays."

Signed:

Mr Stuart Wolfe
Expert.

N. McInnes.

Mrs Nancy McInnes
Non-Expert.

Disk checked
All OK