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DIEBACK FIELD ASSESSMENT GUIDE

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DIEBACK FIELD ASSESSMENT GUIDE

A field aid for the determination of the presence or absence of *P. cinnamomi* within jarrah forests.

COMPRISES:

(1) INTRODUCTION "READ THIS"

(2) HOW TO USE THIS GUIDE.

(3) DECISION ROUTINES:-

- (a) Field Assessment - A,B,C,D,E.
- (b) Sample Results - F

(4) FLOWCHART LABEL DEFINITIONS. "READ AND UNDERSTAND THIS"

(5) DIEBACK ASSESSMENT FIELD SHEET

(6) SAMPLING PROCEDURE

(7) EQUIPMENT LIST

INTRODUCTION

The forest is a complex and dynamic community of plants which to the keen observer will vary markedly over quite small distances. Differences within the forest arise from the interaction of a number of environmental factors, eg. soil types, climatic variations, seasonal influences, time, and to some extent mans management practices.

An exotic fungus P. cinnamomi has been introduced into this already intricate forest situation. The observable biological impact of the fungus will obviously be extremely varied i.e. from the obvious to the not so obvious, to the indecipherable, and will depend largely on the overall interaction of all factors influencing a given site.

During his daily dealings with the forest a forest officer will find:-

(a) Areas of obvious P. cinnamomi infection.

(b) Areas of apparently P. cinnamomi free forest.

(c) Suspect areas i.e. forest in which the evidence for the presence or absence of P. cinnamomi is inconclusive.

This guide aims only to provide a logical, systematic method for the field assessment of P. cinnamomi presence or absence. It does not replace the need for each officer to formulate a reliable but necessarily flexible set of interpretation standards to be applied when assessing a variety of field sites for P. cinnamomi presence or absence.

HOW TO USE THIS GUIDE

STEP 1:

Read this guide thoroughly, be familiar with its terms and procedures.

STEP 2:

Walk over and thoroughly examine the area of forest in question eg. minimum of 100m x 100m for a suspected spot infection or the whole logging coupe if involved in demarcation of P. cinnamomi infections prior to operations commencing.

Look for and examine:-

(a) Forest overstorey - structure, vigour, age, species content, signs of environmental or management stress.

(b) Forest understorey community - structure, vigour, age, species content, signs of environmental or management stress.

(c) Soil:- type, variations, features, characteristics.

(d) Topography and aspect.

(e) Environmental factors influencing the site:- temperature regimes, drought, growth competition, soil fertility, drainage.

(f) Evidence of plant stress:- fire, epicormics, coppice, dead tops or limbs, insect attack, condition and numbers of regrowth of all species.

(g) Proximity of obvious P. cinnamomi infections.

(h) Signs of recent disturbance, logging, mining etc.

STEP 3:

Return to the specific area(s) of interest and fill out a field sheet and collect a soil sample. The field sheet is designed to record all the relevant information about the area you have just examined, and often represents the minimum amount of information needed to reliably interpret P. cinnamomi presence or absence.

STEP 4:

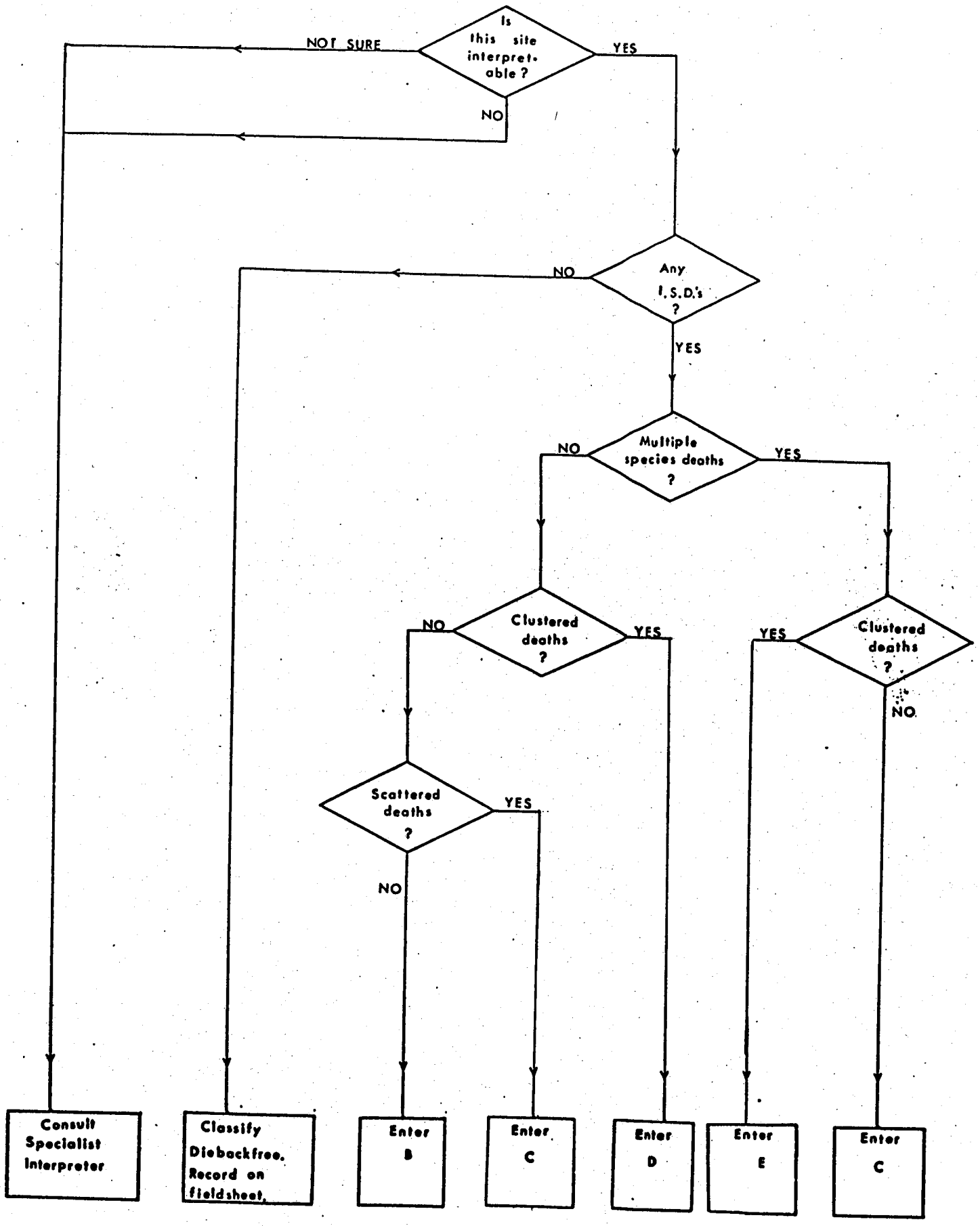
Enter the flow chart at Routine A - Field Assessment

FLOW CHART LABEL DEFINITIONS

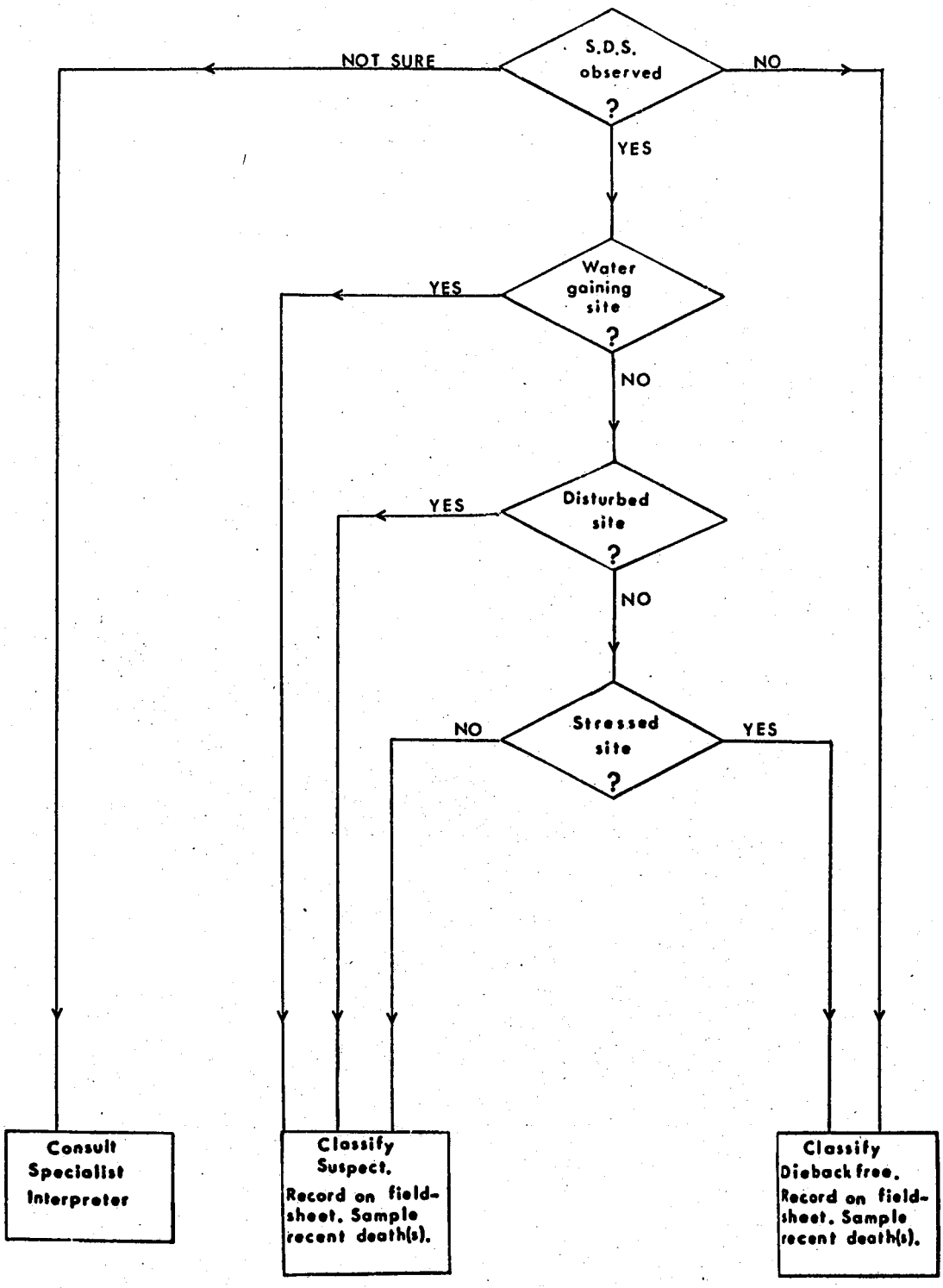
(Note: Labels only, not standard terminology)

LABEL	DEFINITION
Interpretable Site	The forest has a covering of known P. cinnamomi indicator plants which is dense enough to exhibit a decipherable biological impact, should P. cinnamomi be present.
I.S.D.(s)	Indicator Species Death(s)
Multiple Species Death.	Some or all of the indicator species found dead within the same area with some obvious association between the deaths.
Clustered Deaths	Two or more deaths of one species within close proximity to one another, with an apparent association between the deaths.
Scattered Deaths	Several single plant deaths or very small groups of deaths of one or more species,dispersed over an area with many healthy indicator plants between the scattered deaths. There is no apparent association between the deaths.
Isolated Death	A single plant death that has no apparent association with any other death and may be within an area populated by many healthy indicator species.
Sudden Death Syndrome (S.D.S.)	Total crown death occurred at the same time, no subsequent epicormicing or coppicing.
Chronological Sequence	Where P. cinnamomi is present a pattern may be seen amongst the remains of the dead plants. eg. Recently killed plants with leaves still on them at the outer edge of the affected area, with plant stags only further in and towards the centre of the site partly rotted stags.
Water Gaining Site	Any creek, gully, depression or hollow-even on an upland area, which may reasonably collect and hold moisture for periods long enough to favour fungal development.
Disturbed Site	Any site near a road or track. Any site known to have suffered disturbance by logging, mining or even animals such as pigs.
Stressed Site	A site which shows evidence of plant stress induced by fire, insect, drought, competition or old age etc.
Field Interpretation	(a) Diebackfree:- Forest apparently free of P. cinnamomi. (b) Suspect:- Forest in which the evidence for P. cinnamomi presence or absence is inconclusive. (c) Dieback:- Forest in which dieback symptoms are present.

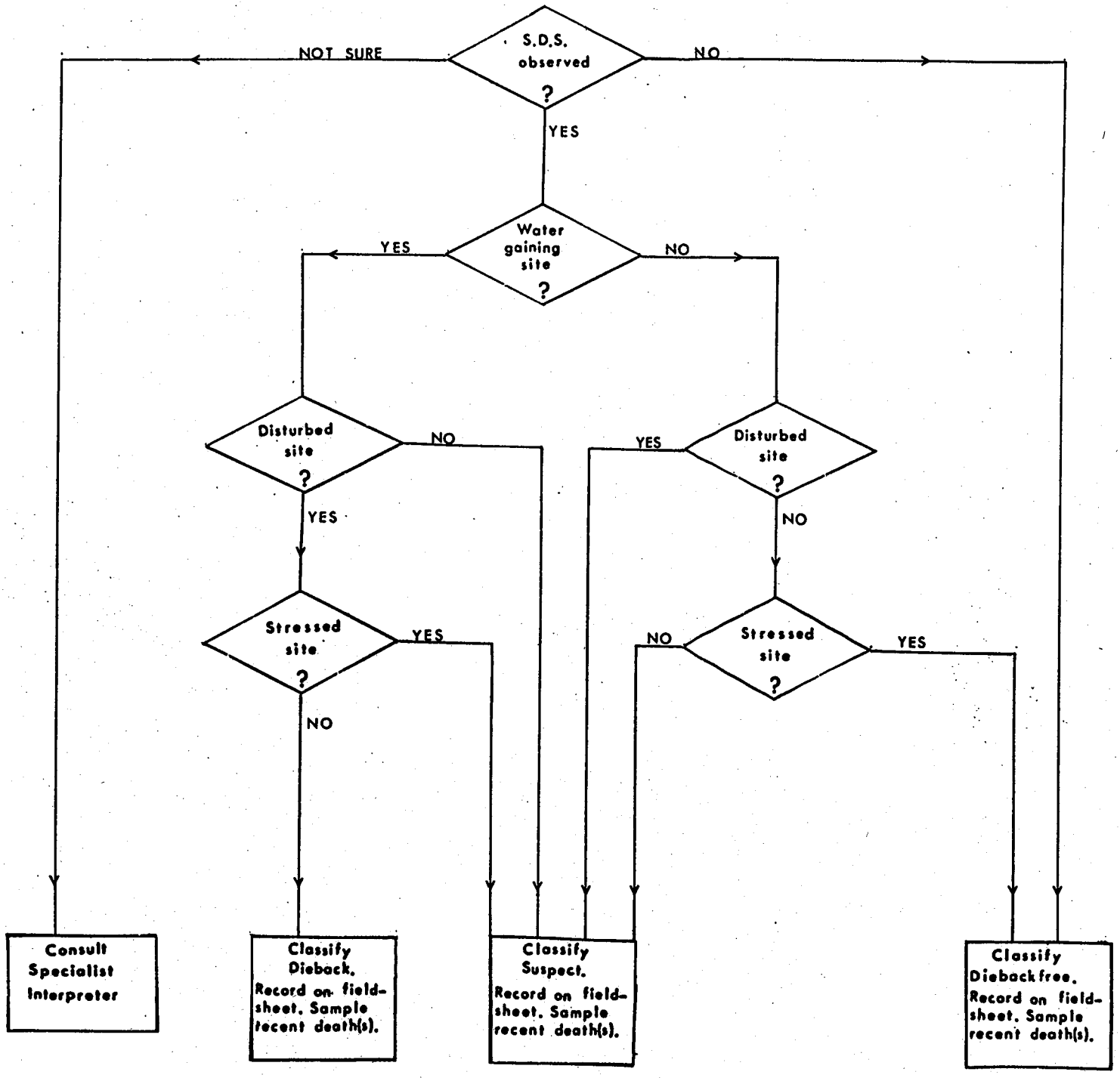
Routine A - Field assessment



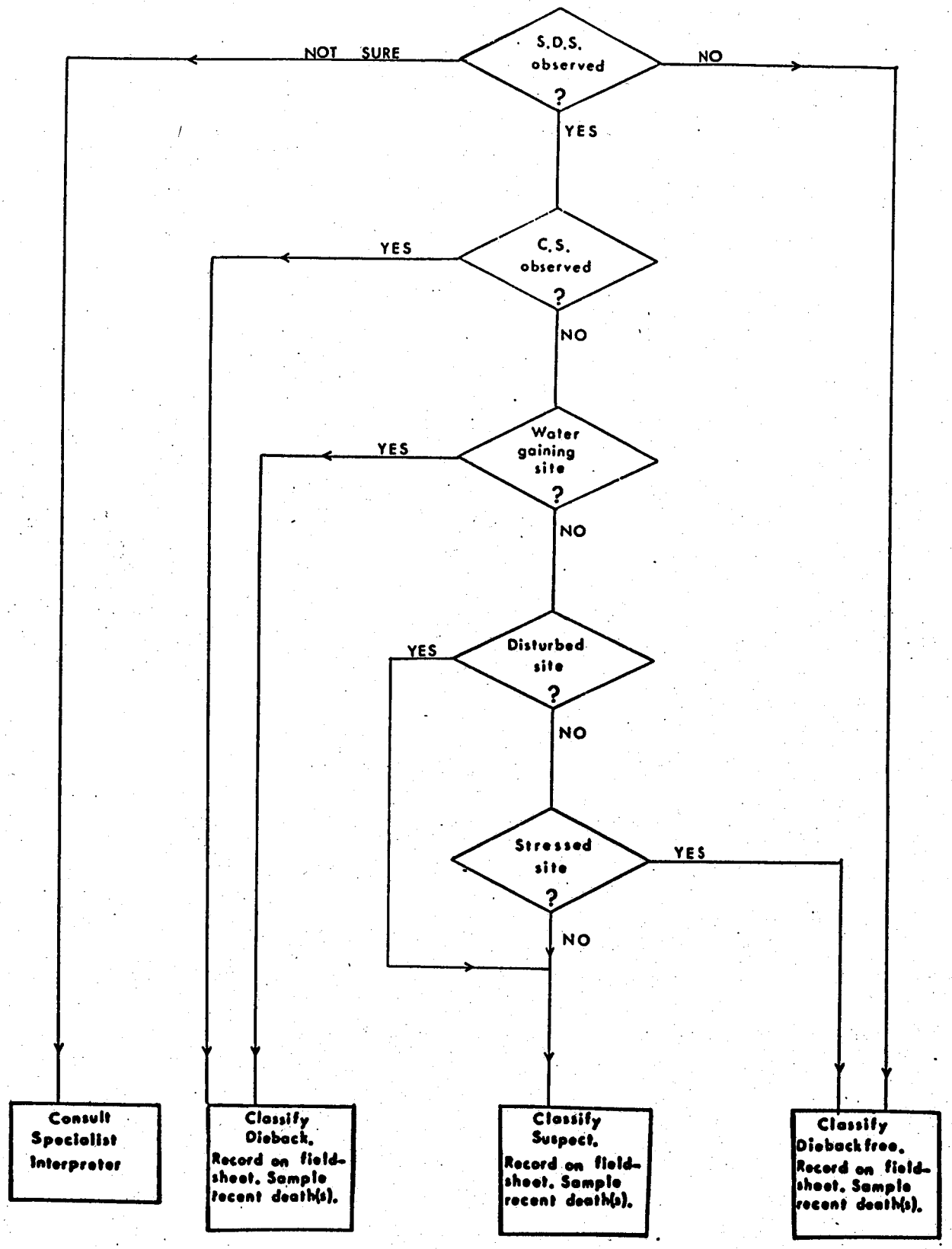
Routine B


S.D.S. observed ?
NOT SURE
NO
YES
Water gaining site ?
YES
NO
Disturbed site ?
YES
NO
Stressed site ?
NO
YES
Consult Specialist Interpreter
Classify Suspect. Record on field-sheet. Sample recent death(s).
Classify Dieback free. Record on field-sheet. Sample recent death(s).

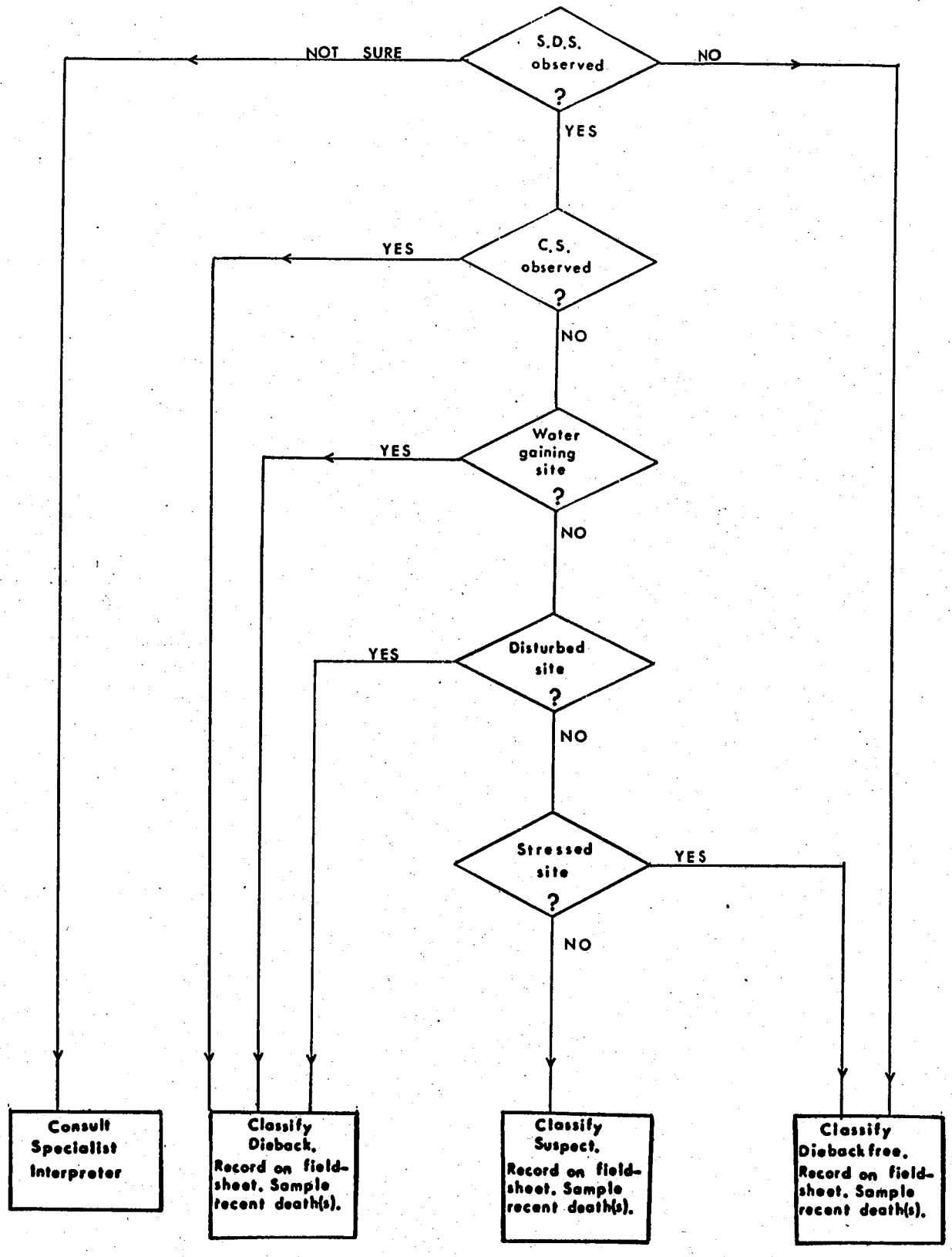
Routine C


S.D.S. observed ?
NOT SURE
NO
YES
Water gaining site ?
YES
NO
Disturbed site ?
NO
YES
Stressed site ?
YES
NO
Disturbed site ?
YES
NO
Stressed site ?
NO
YES
Consult Specialist Interpreter
Classify Dieback. Record on field-sheet. Sample recent death(s).
Classify Suspect. Record on field-sheet. Sample recent death(s).
Classify Dieback free. Record on field-sheet. Sample recent death(s).

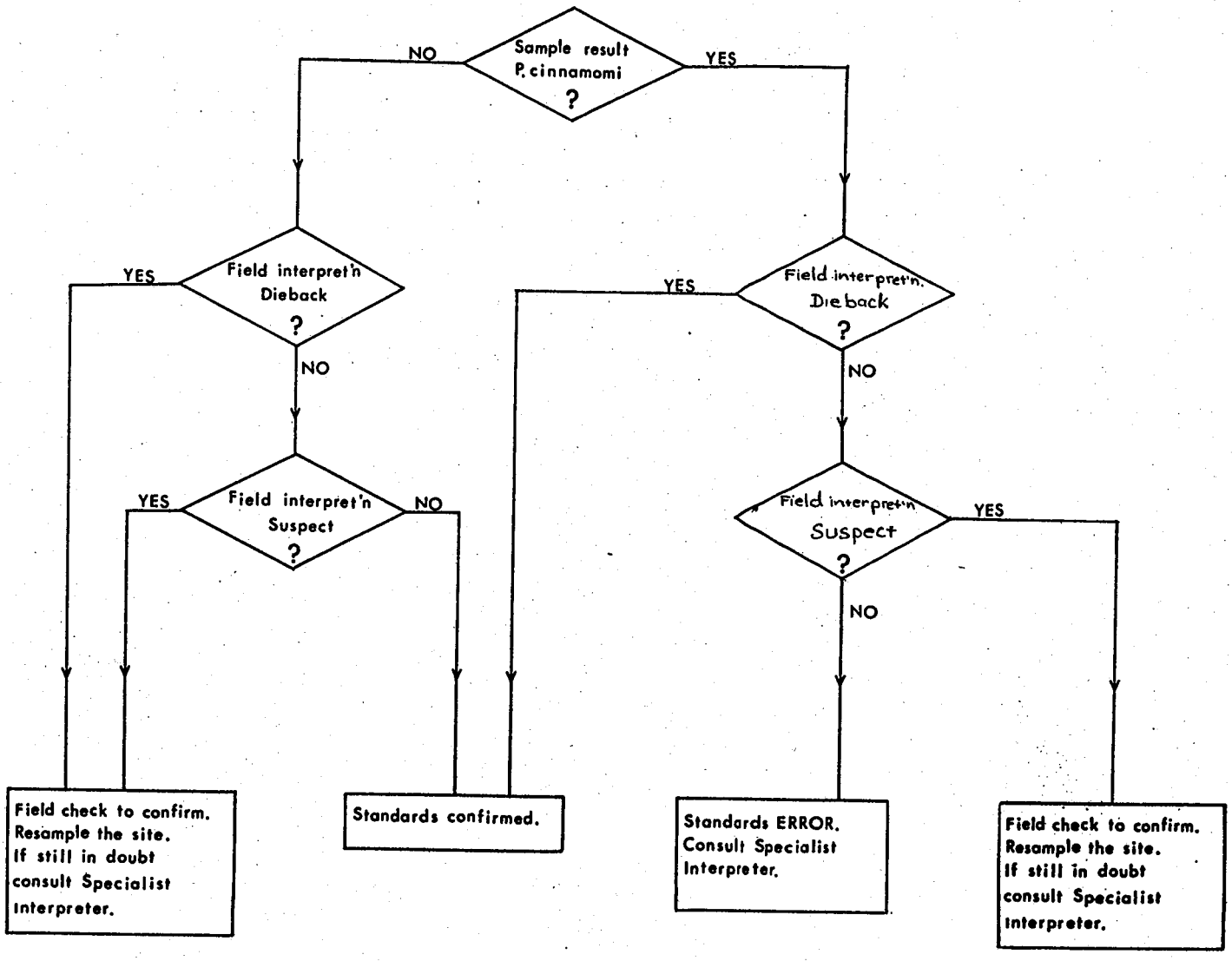
Routine D


S.D.S. observed ?
NOT SURE
NO
YES
C.S. observed ?
YES
NO
Water gaining site ?
YES
NO
Disturbed site ?
YES
NO
Stressed site ?
YES
NO
Consult Specialist Interpreter
Classify Dieback. Record on field-sheet. Sample recent death(s).
Classify Suspect. Record on field-sheet. Sample recent death(s).
Classify Dieback free. Record on field-sheet. Sample recent death(s).

Routine E


S.D.S. observed ?
NOT SURE
NO
YES
C.S. observed ?
YES
NO
Water gaining site ?
YES
NO
Disturbed site ?
YES
NO
Stressed site ?
YES
NO
Consult Specialist Interpreter
Classify Dieback. Record on field-sheet. Sample recent death(s).
Classify Suspect. Record on field-sheet. Sample recent death(s).
Classify Dieback free. Record on field-sheet. Sample recent death(s).

Routine F - Sample Results



FIELD SAMPLE TECHNIQUE

1. Fill in a "Dieback Assessment Sheet" for the area to be sampled.

2. Select a recently killed indicator plant i.e. preferably one which still has lime-green or orange leaves still present on it.

3. Using an implement sterilized with Biogram or similar (refer Dwellingup Research) dig down and expose the roots and stem of plant to a depth of approximately 20cm.

4. Cut sections of root, bark and cambium from below ground level from at least 3 sides of the plant. (The older the death the deeper the cut into the cambium region should be.)

5. Place the tissue and 2 or 3 large handfuls of soil from around the plant base into a plastic bag and seal. (Resterilise implement and ensure no soil is carried on your hands etc. to the next sample site). If possible sample more than one plant per site, but include all material as one sample i.e. only one bag per site please.

6. Clearly label the sample bag with:

   (a) Division of origin and date of collection.

   (b) Sequential sample number for your Division prefixed with your Divisional code number eg.

   the 12th sample taken by Manjimup Division would be sample number "06 - 12".

   the 13th sample number "06 - 13" etc.

   (c) Place a tag in the bag with this information duplicated on it.

7. Tie a duplicate tag to the sample site and mark the site with coloured plastic tape.

8. Despatch the samples for laboratory analysis to Dwellingup Research in a box clearly labelled "Soil/Tissue Samples for P. cinnamomi Analysis" together with a covering note which lists:

   (a) The Division of origin of the samples.

   (b) The officer to contact regarding results/difficulties etc.

   (c) All sample numbers and their date of collection.

   (d) The original "Dieback Assessment Sheets" for each sample.

   NOTE:

   Sample analysis takes a minimum of 5 days after initial setting up which may be delayed up to a week in times of high demand. Plates and cups which show no P. cinnamomi are kept for a further 5 days before being re-examined. If no P. cinnamomi is evident after 10 days, then the process is repeated. Thus, it will be a minimum of 20 days from the receipt of a sample at Dwellingup before a negative result is acknowledged. Positive results may be advised sooner. All sample results will be forwarded in writing unless other-wise requested.

   Contact the A.P.&.I. Section direct regarding any difficulties associated with the above.

DIEBACK ASSESSMENT SHEET
FIELD OBSERVATIONS & I.S.D. TISSUE/SOIL SAMPLE INFORMATION

(ORIGINAL: TO BE SENT WITH SAMPLES DUPLICATE: FILE IN DIVISION)

INTERPRETER: DIVISION: DATE:

FOREST TYPE	
UNDERSTOREY DESCRIPTION	
ASPECT AND LOCATION CLASS	
SOIL TYPE	
INDICATOR SPECIES DEATHS	B. grandis ☐ x. preissei ☐ M. reidlei ☐ P. longifolia ☐ E. marginata ☐ OTHER: .....
IS THERE A DIEBACK DEATH PATTERN EVIDENT AMONGST ISD'S ON THIS SITE?	YES ☐ NO ☐ DESCRIBE: .....
WHAT IS THE NATURE OF THE PLANT STRESS OR DEATHS WHICH OCCUR ON THIS SITE?	SUDDEN DEATH ☐ ½ DEATH ☐ DEATH BY STAGES ☐ OLD AGE ☐ EPICORMICS PRESENT ☐ FIRE ☐ COPPICING ☐ COMMENTS: .....
MAJOR SITE FACTORS INFLUENCING PLANT GROWTH ON THIS SITE.	ROCK OUTCROPS ☐ DROUGHT PRONE AREA ☐ COMP-ETITION ☐ WATER GAINING DEPRESSION ☐ CREEK ☐ COMMENTS/OTHERS .....
POSSIBLE DISEASE VECTOR	NONE APPARENT ☐ ROADSIDE ☐ TRACK ☐ ANIMAL ☐ OTHER: .....
OTHER OBSERVATIONS	
SPECIES SAMPLED	SAMPLE NUMBER:
FIELD INTERPRETATION DECISION(ex FLOW CHART)	DIEBACKFREE ☐ SUSPECT ☐ DIEBACK ☐

SAMPLE LOCATION TIE SKETCH

SAMPLE LOCATION SIX FIGURE GRID REF.
.....

SAMPLE RESULT:

SAMPLING EQUIPMENT - *P. cinnamomi*

1. Backpack eg. Ventura 78 available from the Scout Shop, for carrying equipment and collected samples.

2. Plastic bags eg. 150 micron 350mm x 350mm. Note: Extra thick bags are recommended to prevent cross infection through breaks in the sides of the bags.

3. "Ry-RAP" Cable ties for sealing sample bags.

4. Aluminium tags and plastic tape for labelling sample sites and samples.

5. Mattock - preferably a minature version.

6. Fungicide eg. Biogram for sterilising mattock. Available from Dwellingup Research. Note: Diluted Solution viable only for 5 days.

7. Field sheets, clip board, maps, marker pens, pencils, etc.