ANSAC Public Hearing

Santa Cruz County

Date: August 16, 2000

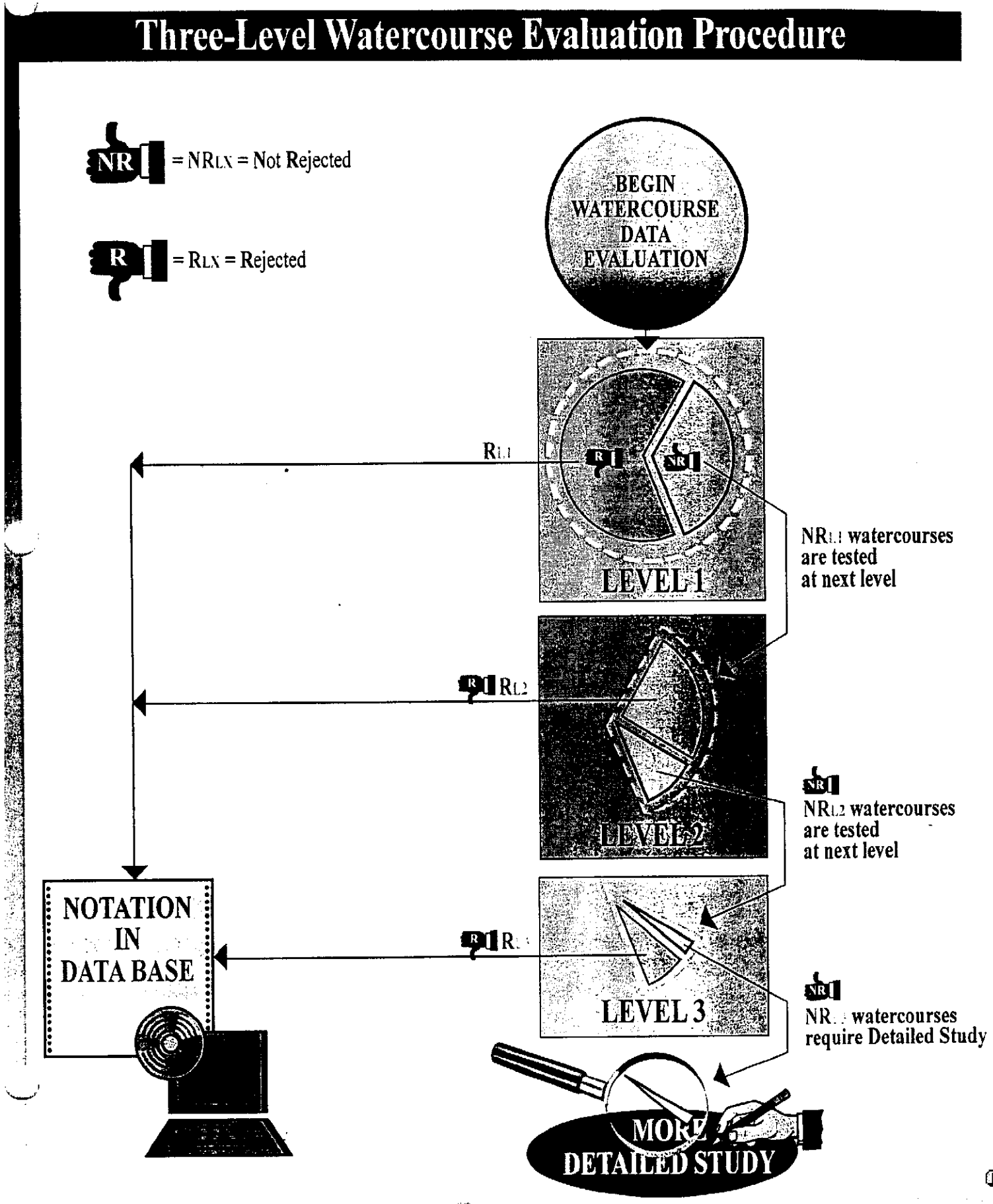
Time: 1:00 PM

Venue: Nogales, Arizona

Stantec Consulting, Inc.
Phoenix, Arizona
In association with:
[illegible] Ecology & Geomorphology, Inc.
Tempe, Arizona

03

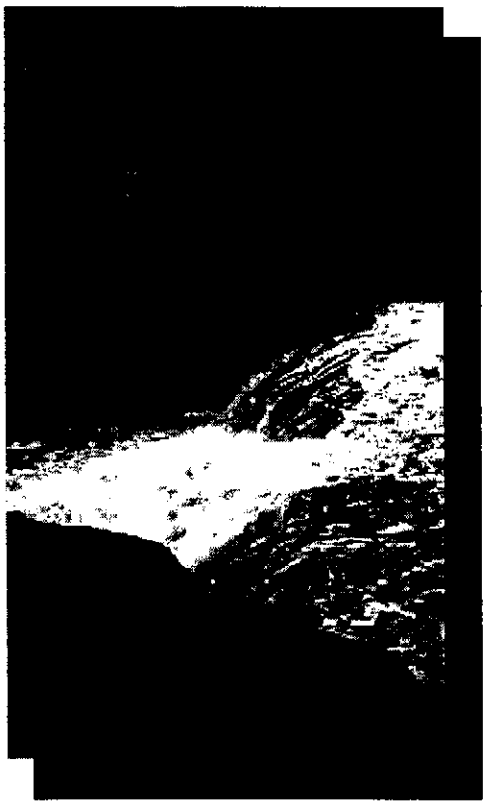
Figure 2
THREE-LEVEL WATERCOURSE
EVALUATION PROCEDURE



Level 1 Evaluation

[redacted]

Coarse Sort
Eliminate Watercourses Most Likely to be
Non-Susceptible to Navigation



[redacted]

Quantitative Screening Analysis
Binary Database Queries

[redacted]

Stream Type
Dam Information
Historical Boating
Modern Boating
Fish
Special Status

[redacted]

Apply full test to all watercourses in the database catalog

[redacted]

RL1: Watercourses which are most likely non-susceptible to navigation
NRL1: Watercourses which require qualitative evaluation at Level 2

Figure 3
LEVEL 1 SCREENING PROCEDURE

Level 1 Screening Procedure

ADDITIONAL STREAM SEGMENTS (ADD TO ALRIS MASTER LIST?)

YES

NO

MASTER WATERCOURSE LIST (Arizona Land Resources Information System)

Begin testing

PERENNIAL?

YES — Note answer in Database, then proceed to next test

NO

WITH DAM?

YES — Note answer in Database, then proceed to next test

NO

HISTORICAL BOATING?

YES — Note answer in Database, then proceed to next test

NO

MODERN BOATING?

YES — Note answer in Database, then proceed to next test

NO

WITH FISH?

YES — Note answer in Database, then proceed to next test

NO

SPECIAL STATUS?

YES

NO

R — R

NOTATION IN DATA BASE

NR — NR

NOTATION IN DATA BASE

CONDUCT LEVEL 2 EVALUATION

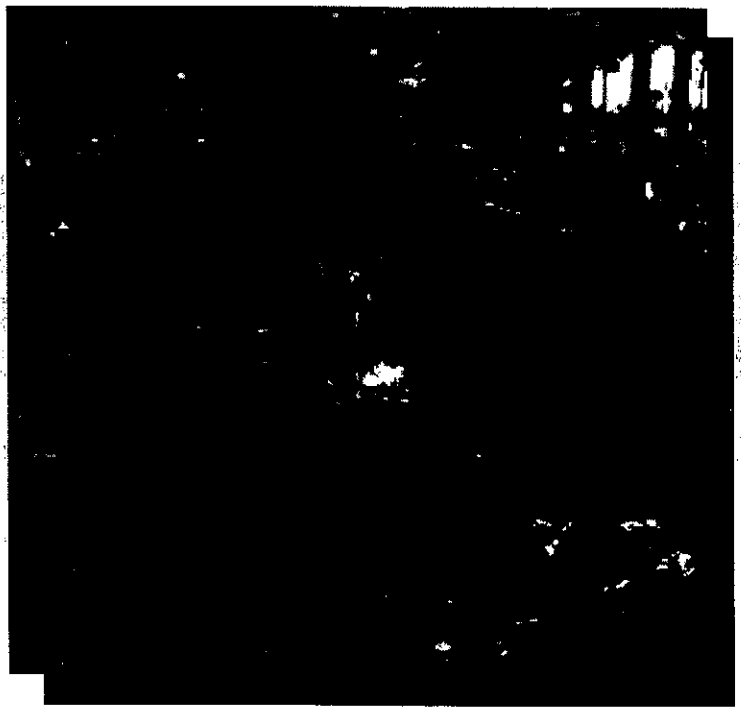
Level 2 Evaluation

[redacted]

Refined Sort
Eliminate Watercourses Unlikely to be Susceptible to Navigation

[redacted]

Qualitative Approach
By Inspection
Quality Control Check



[redacted]

Fish Categories
Boating Account Verification
Special Status Specifics
Outlier Verification

[redacted]

Apply to NRL1 watercourses in the database catalog

[redacted]

RL2: Watercourses which are unlikely to be susceptible to navigation

NRL2: Watercourses which merit quantitative engineering analysis at Level 3

Level 2 Analysis - Refined Approach

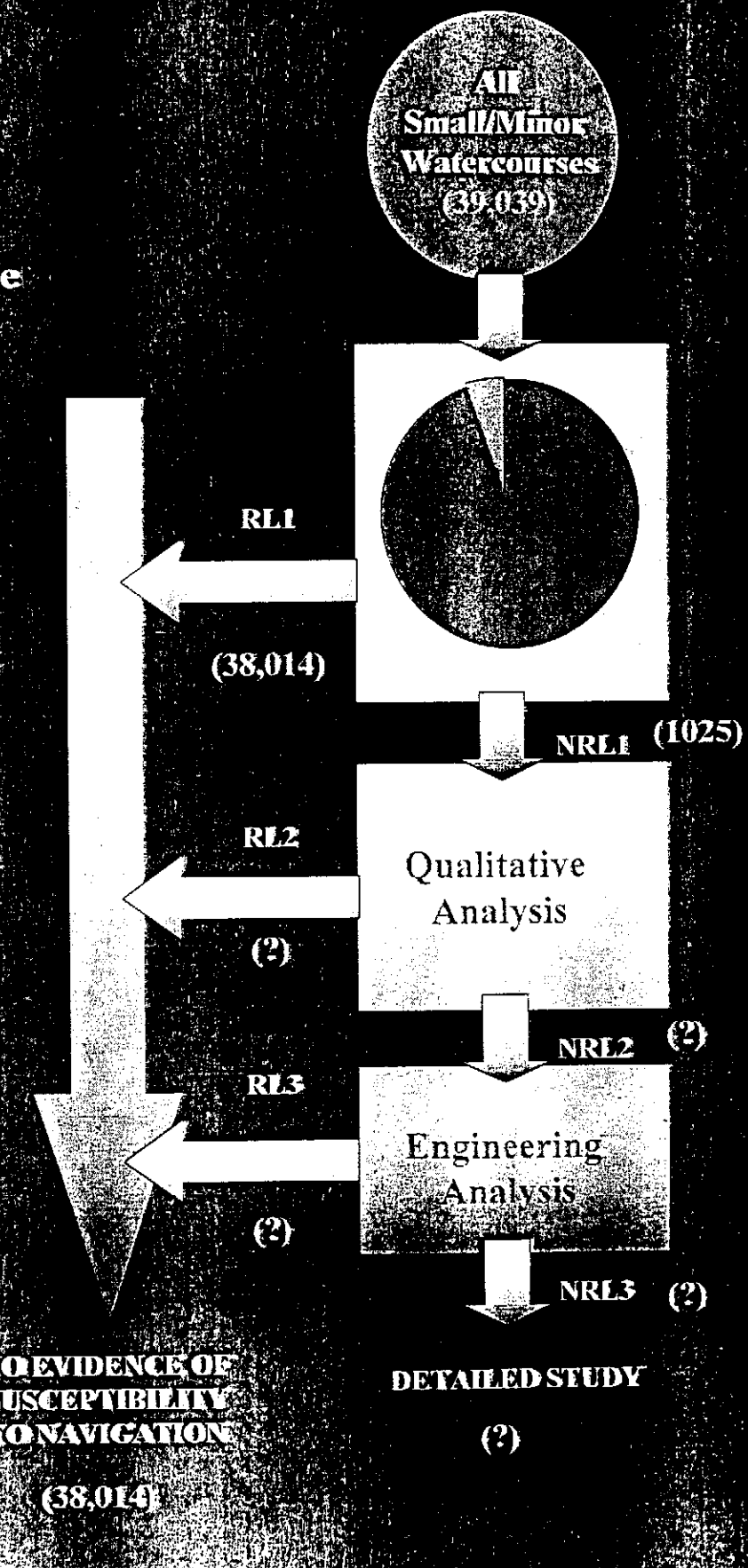
Justifications for the Refined Approach

(1) The equal-weight system puts all streams (with the same number of affirmative responses) on the same level and importance.

(2) Numerical weights should be established for the six criteria assigning the highest weight to the criterion which has the most significant bearing to the navigability question and the lowest weight to the criterion which has the least significant bearing bearing to the navigability question.

(3) A better ranking system can be made using the established weighting system.

Watercourse Evaluation Analysis



Level 2 Analysis - Refined Approach

Steps in Establishing the Numerical Weights

(1) Identify the criteria involved.

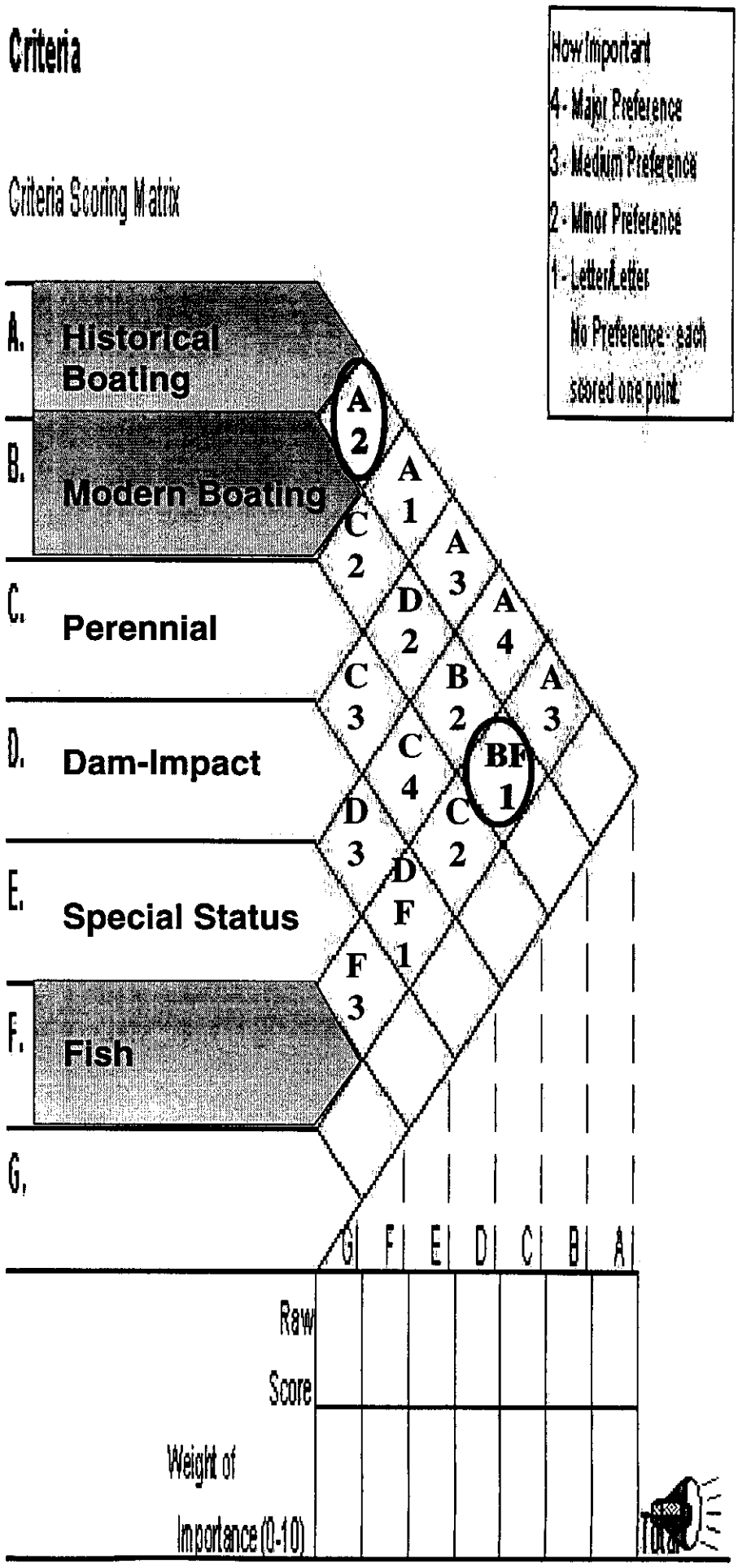
(2) Compare each criterion with the rest of the criteria. For each comparison, assign a letter (indicating which criterion is more important) and indicate the level of preference.

For example a rating of A2 indicates that criterion A is a minor preference (2) over the other criterion.

(3) For comparisons where no criterion is preferred, assign a preference level of 1.0

For example a rating of BF1 indicates that no preference is made between criterion B and criterion F.

(4) Complete the exercise.



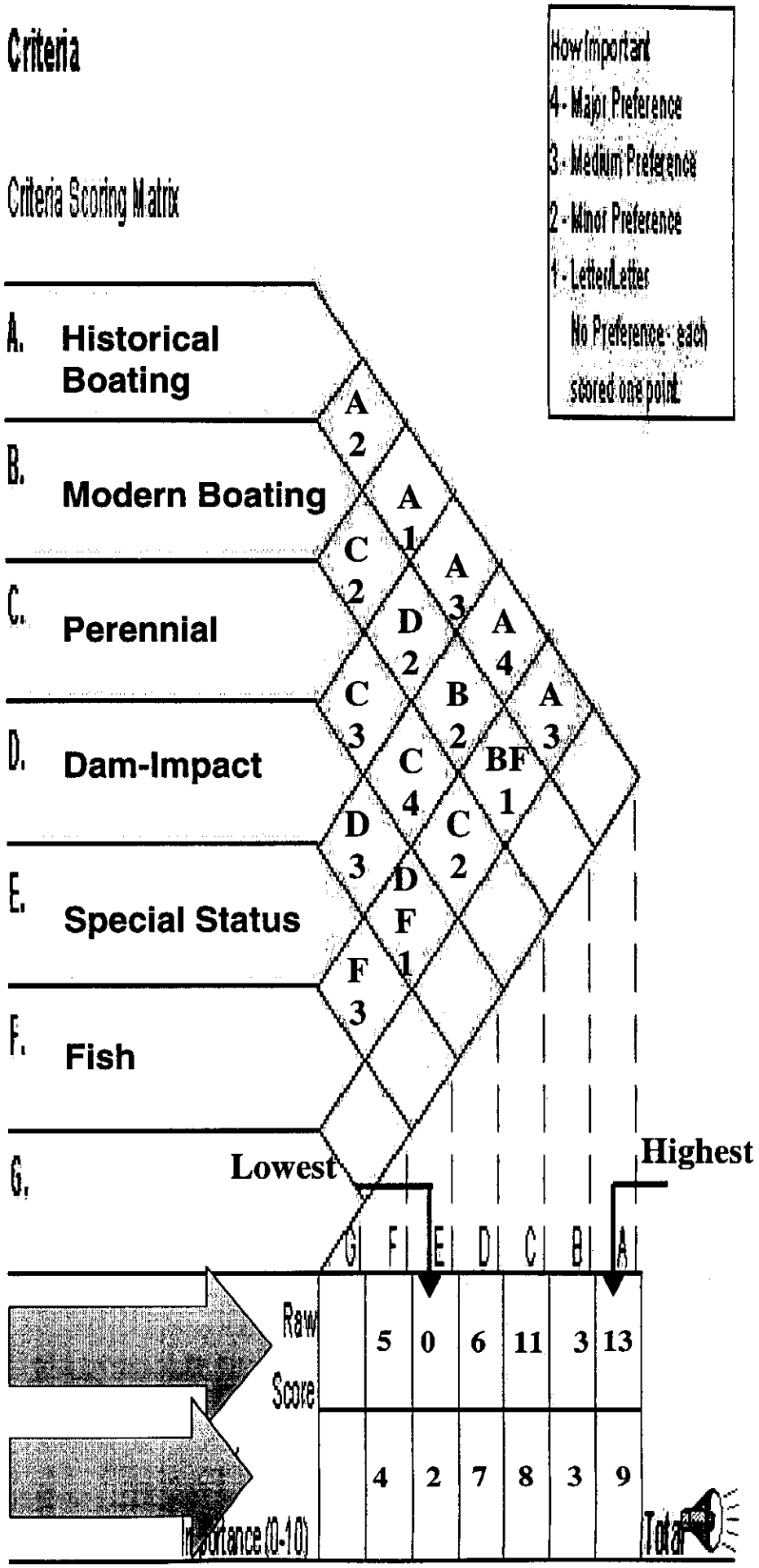
Level 2 Analysis - Refined Approach

Steps in Establishing the Numerical Weights

(5) Evaluate the total raw score for each criterion.

(6) Rank all the criteria based on the total score evaluated.

(7) Assign numerical weights to the criteria. Use a maximum of 10 to the one with the highest score and a minimum of 2 to the one with the lowest score.

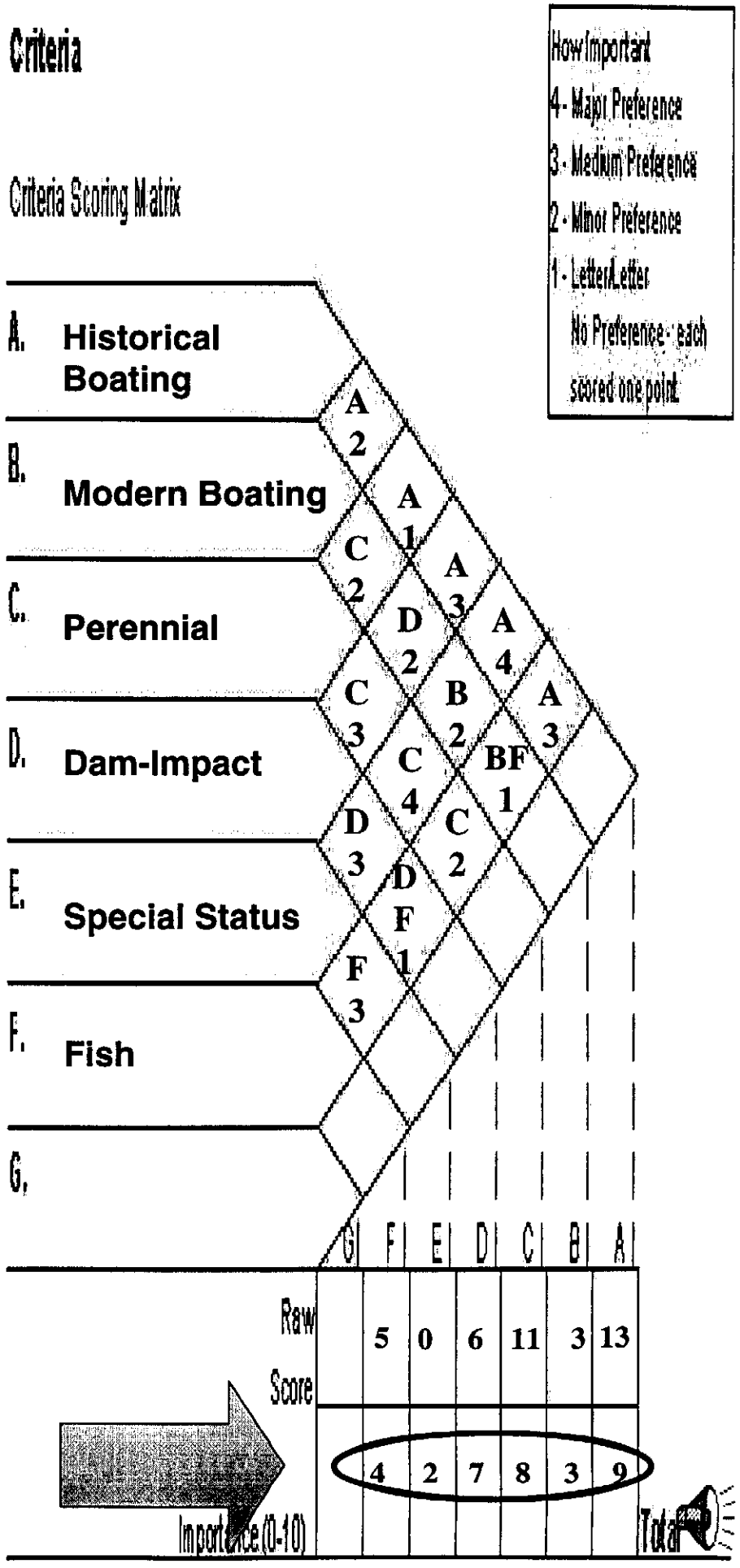


Level 2 Analysis - Refined Approach

Steps in Establishing the Numerical Weights

(8) If a number of participants are involved in the exercise, the numerical weights are determined from the average values evaluated.

	Participants							Ave.
	1	2	3	4	5	6	7	
A.	9	10	10	10	10	10	10	10
B.	3	7	10	9	7	10	7	8
C.	8	5	8	6	6	7	6	7
D.	7	2	4	2	4	5	3	4
E.	2	3	2	2	2	2	2	2
F.	4	3	6	3	3	3	5	4



Level 2 Analysis - Refined Approach

Steps in Establishing the Numerical Weights

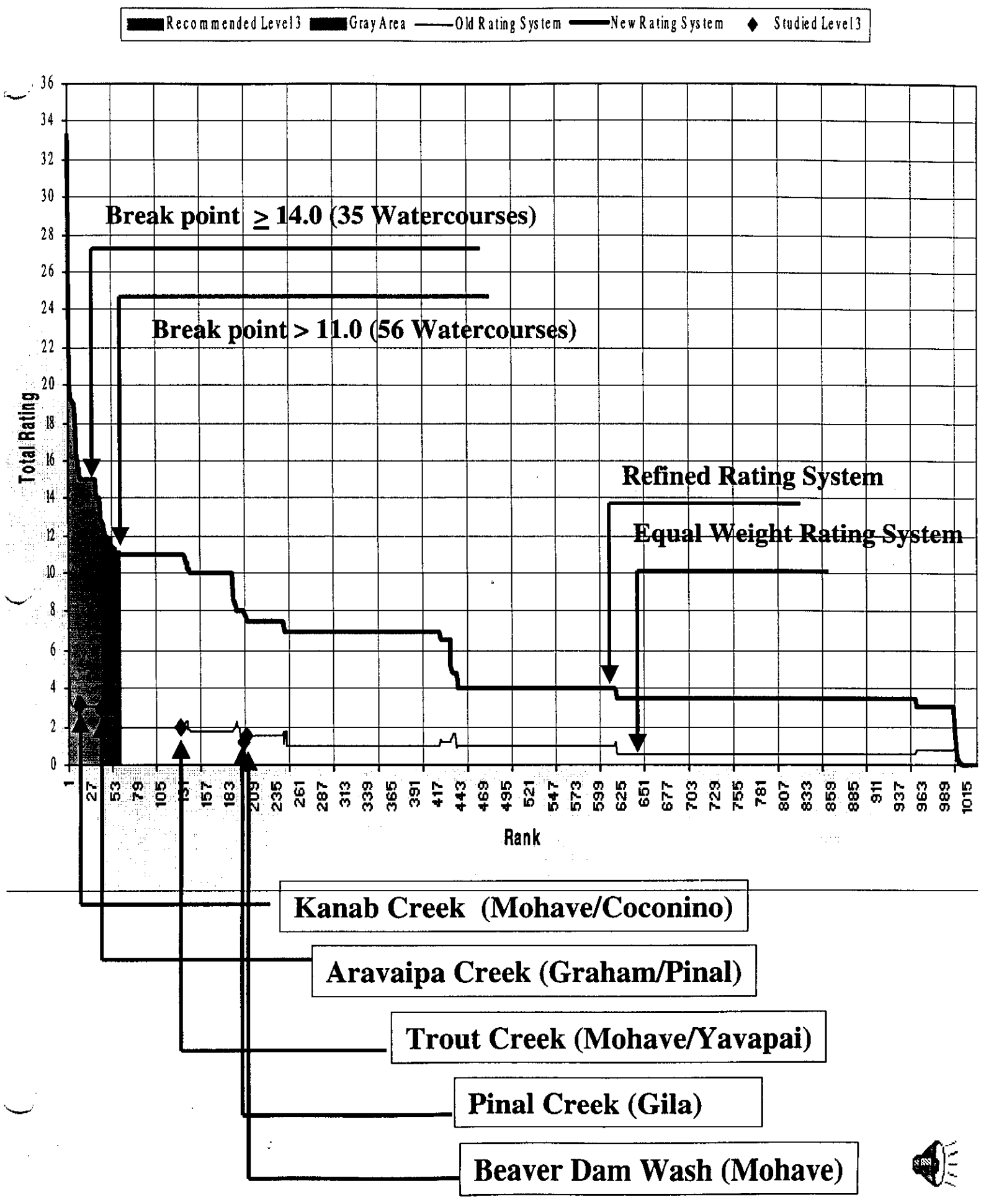
(8) If a number of participants are involved in the exercise, the numerical weights are determined from the average values evaluated.

As an example, the case of Sonoita Creek in Santa Cruz County is considered.

	Participants						Ave.
	2	3	4	5	6	7	
9	10	10	10	10	10	10	10
3	7	10	9	7	10	7	8
8	5	8	6	6	7	6	7
7	2	4	2	4	5	3	4
2	3	2	2	2	2	2	2
4	3	6	3	3	3	5	4

	Rating	Weight	Refined Rating
Hist. Boating	0.0	10	0.0
Mod. Boating	0.0	8	0.0
Perennial	1.0	7	7.0
Dam-Impacted	1.0	4	4.0
Special Status	0.5	2	1.0
Fish	1.0	4	4.0
Total Rating	3.5		16.0

Level 2 Analysis Results



Level 3 Evaluation

[redacted]

- Fine Sort
- Eliminate Watercourses Non-Susceptible to Navigation

[redacted]

- Quantitative Engineering Methodologies
- Detailed Hydrologic and Hydraulic Analysis

[redacted]

- Flow Rate
- Flow Characteristics
- Obstacles

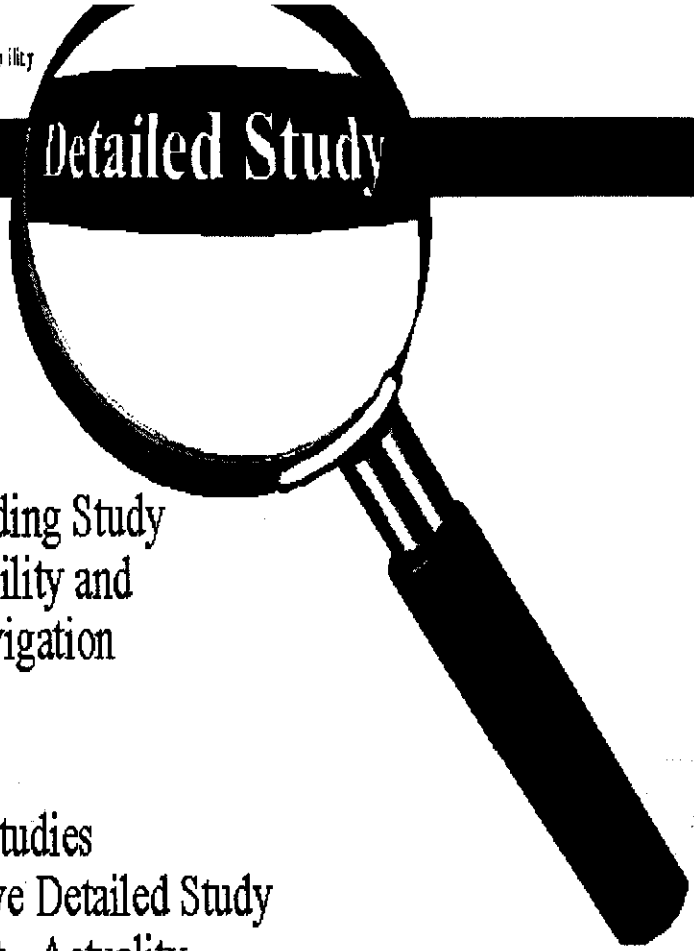
[redacted]

- Apply to NRL2 watercourses in the database catalog

[redacted]

- RL3: Watercourses which are not susceptible to navigation
- NRL3: Watercourses which are susceptible and merit more detailed study

Detailed Study



Goal

Final Sort

Perform Detailed Fact-Finding Study

Addressing Susceptibility and Actual/Historical Navigation

Methodology

Same as for Major River Studies

Qualitative and Quantitative Detailed Study

Test for Navigation In Fact - Actuality

Apply the criteria contained in ARS 37-1128 (D)

Data Requirements

- Extensive
- Technical Data
- Historical Information

Application

- Apply to NRL3 watercourses in the database catalog

Resulting Datasets

- RDS: (Rejected Detailed Study)- Watercourses which are not susceptible to navigation, and with no evidence of actual/historical navigation
- ADS: (Accepted Detail Study)- Watercourses which are susceptible and/or show evidence of actual/historical navigation

Total No. of Watercourses (Statewide):	**39,039**
Unnamed Washes:	**36,798 (94.3%)**
Named Washes:	**2,241 (5.7%)**

LEGEND:

RL1 Stream

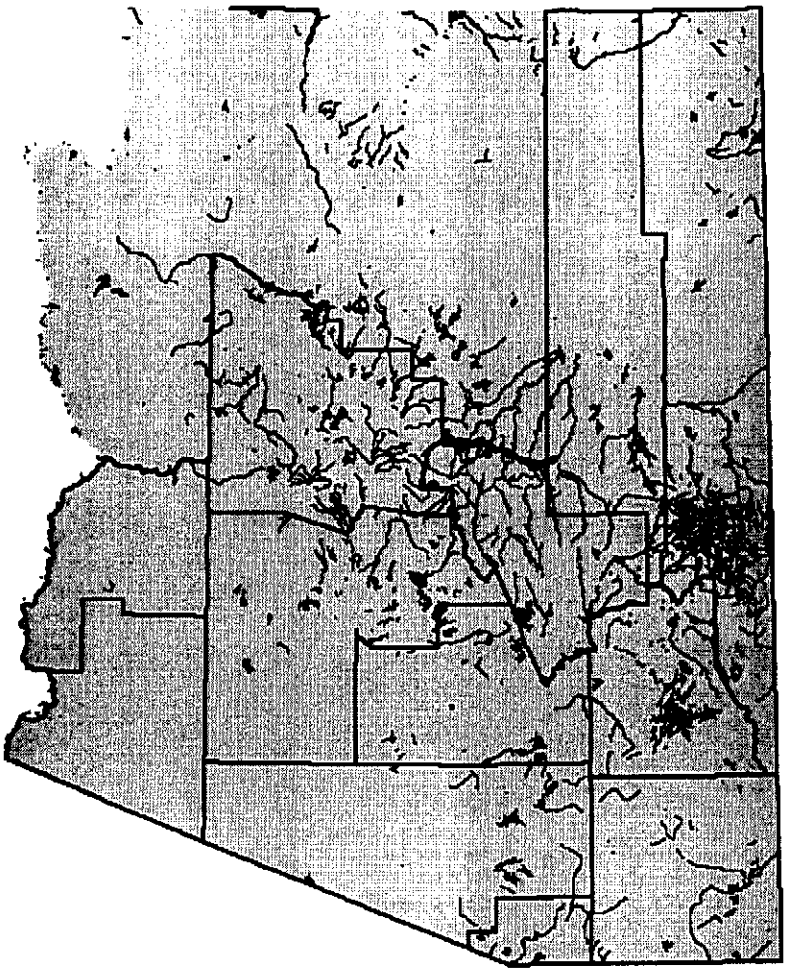
Counties

N

W E

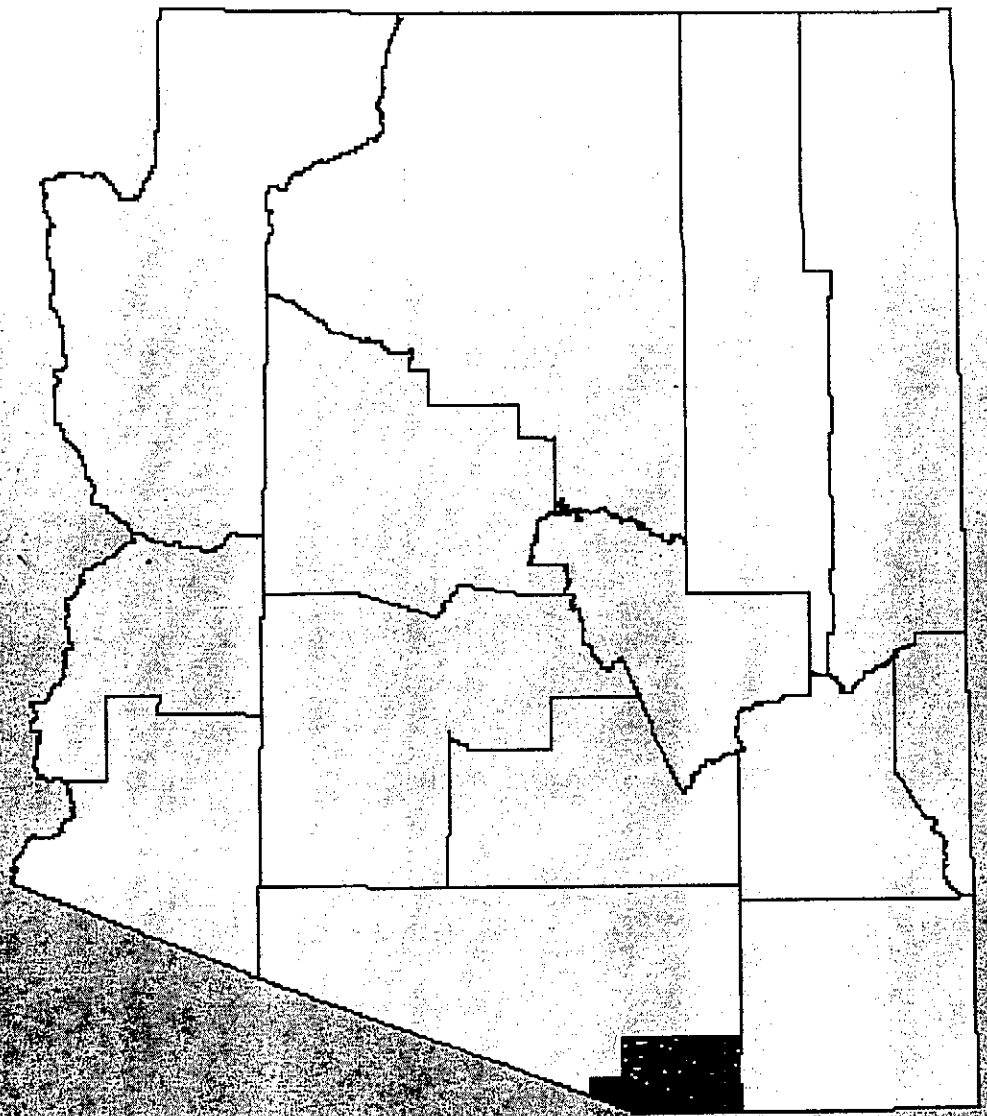
S

Total No. of Watercourses (Statewide):	**39,039**
RL1 Data Set (No. of Watercourses):	**38,014**
RL1 Data Set (Percentage):	**97.4%**



Total No. of Watercourses (Statewide):	**39,039**
NRL1 Data Set (No. of Watercourses):	**1,025**
NRL1 Data Set (Percentage):	**2.6%**

Santa Cruz County

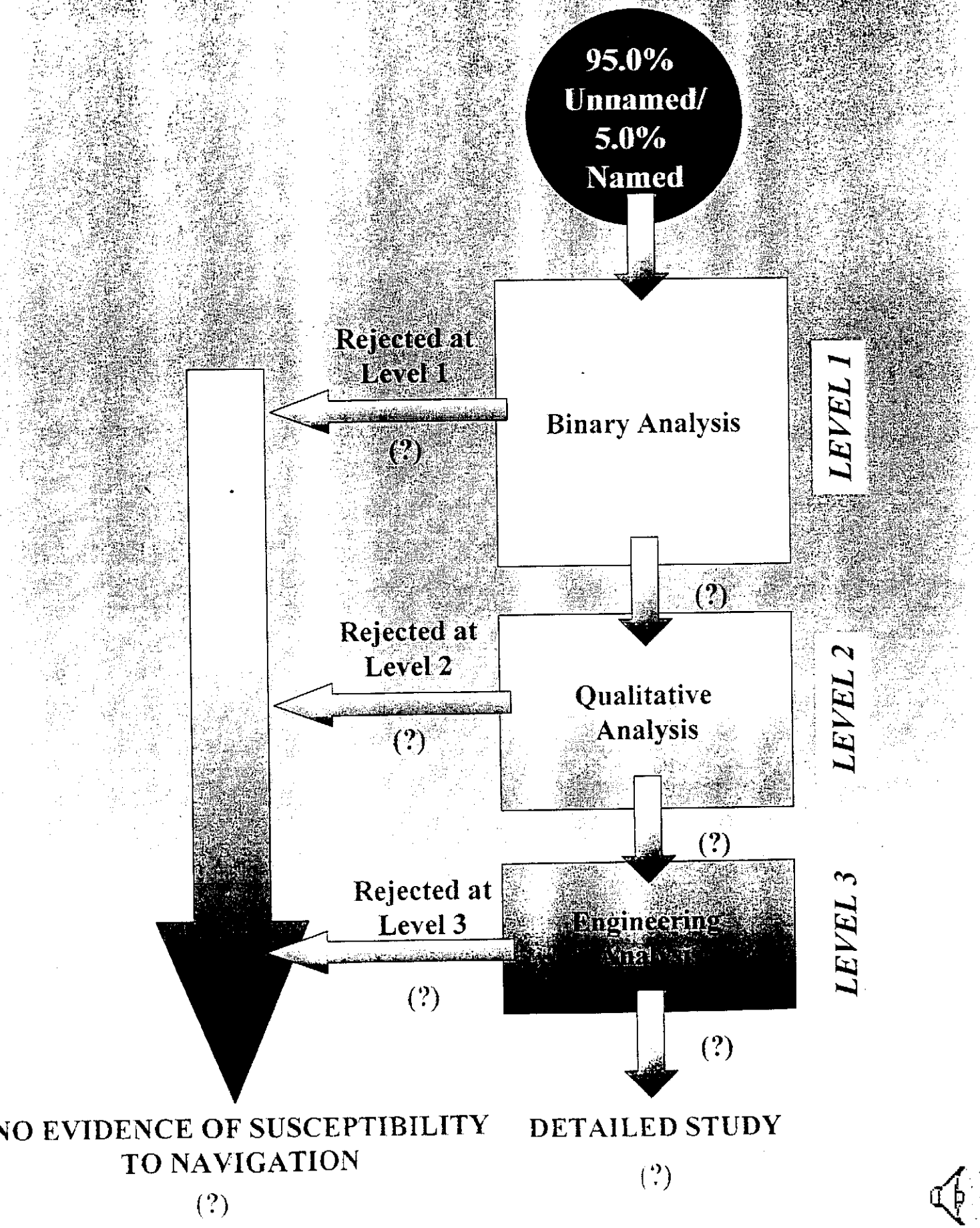


COUNTY DESCRIPTION:

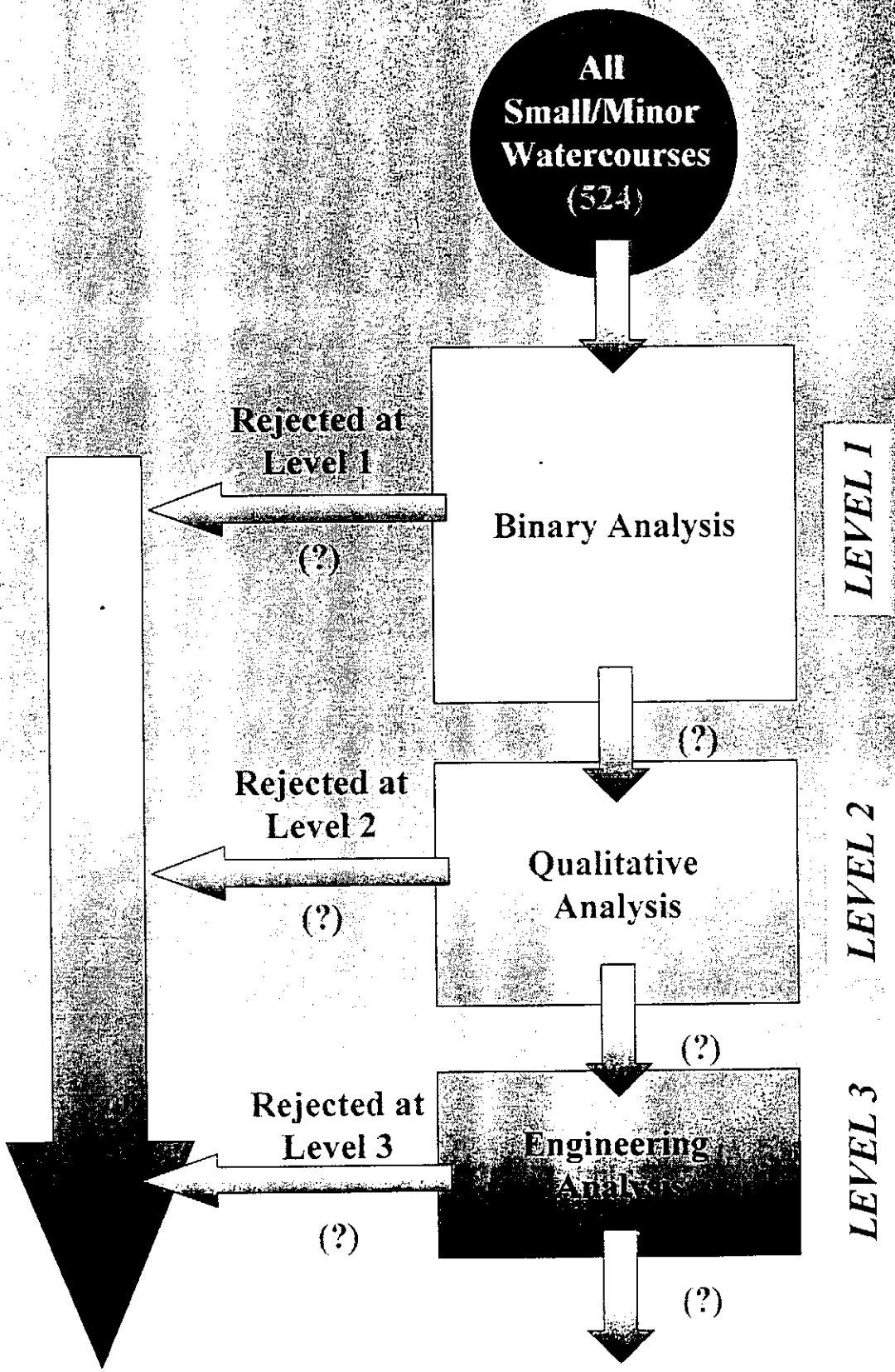
- Located in the southern section of the State.
- Borders the country of Mexico to its south and the counties of Pima to its north and west and Cochise to its east.
- Land area is approximately 1,235 sq. mi.
- It consists of about 524 small & minor watercourses.

Watercourse Evaluation Analysis

for Santa Cruz County

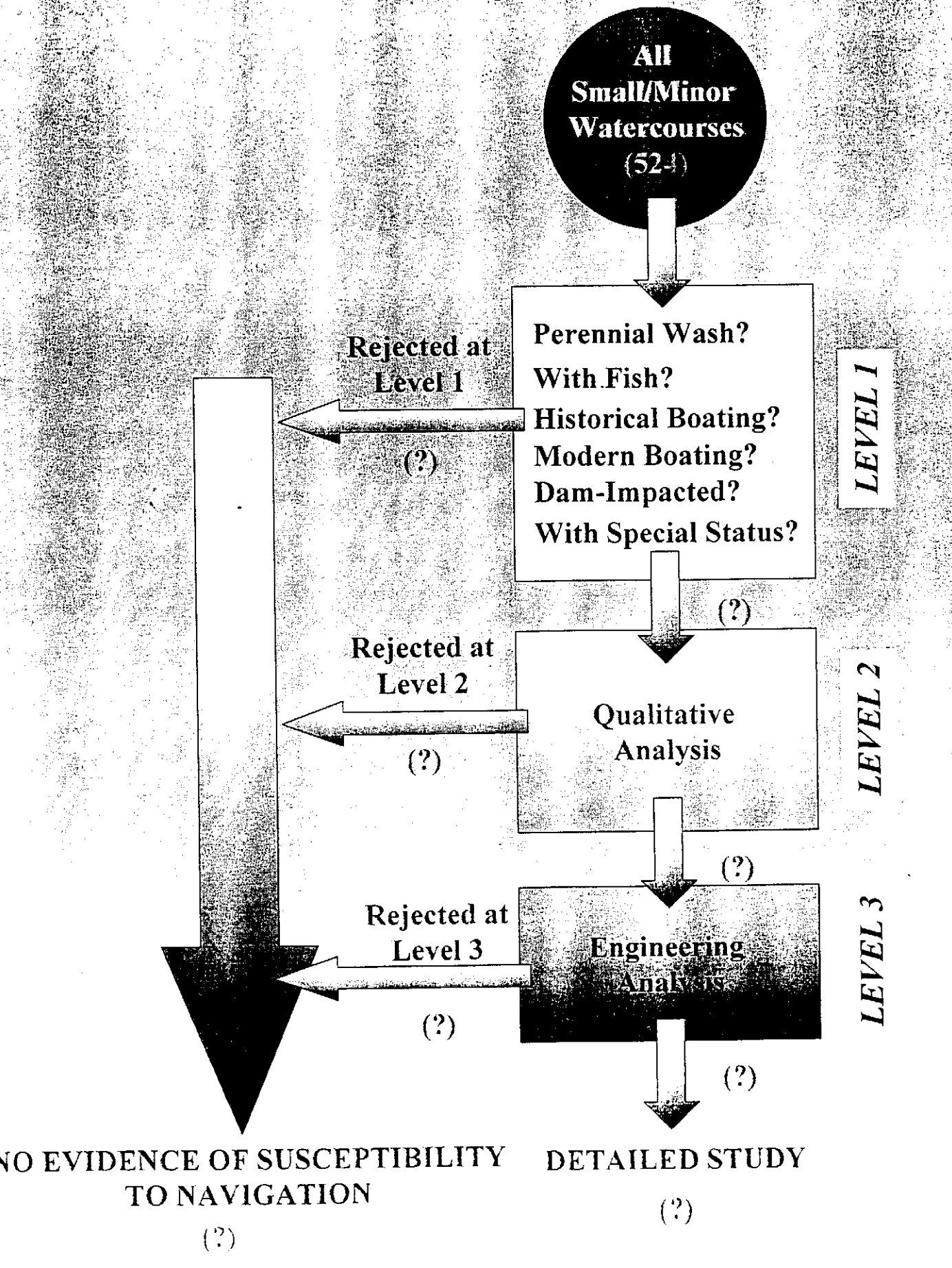


Watercourse Evaluation Analysis
for Santa Cruz County



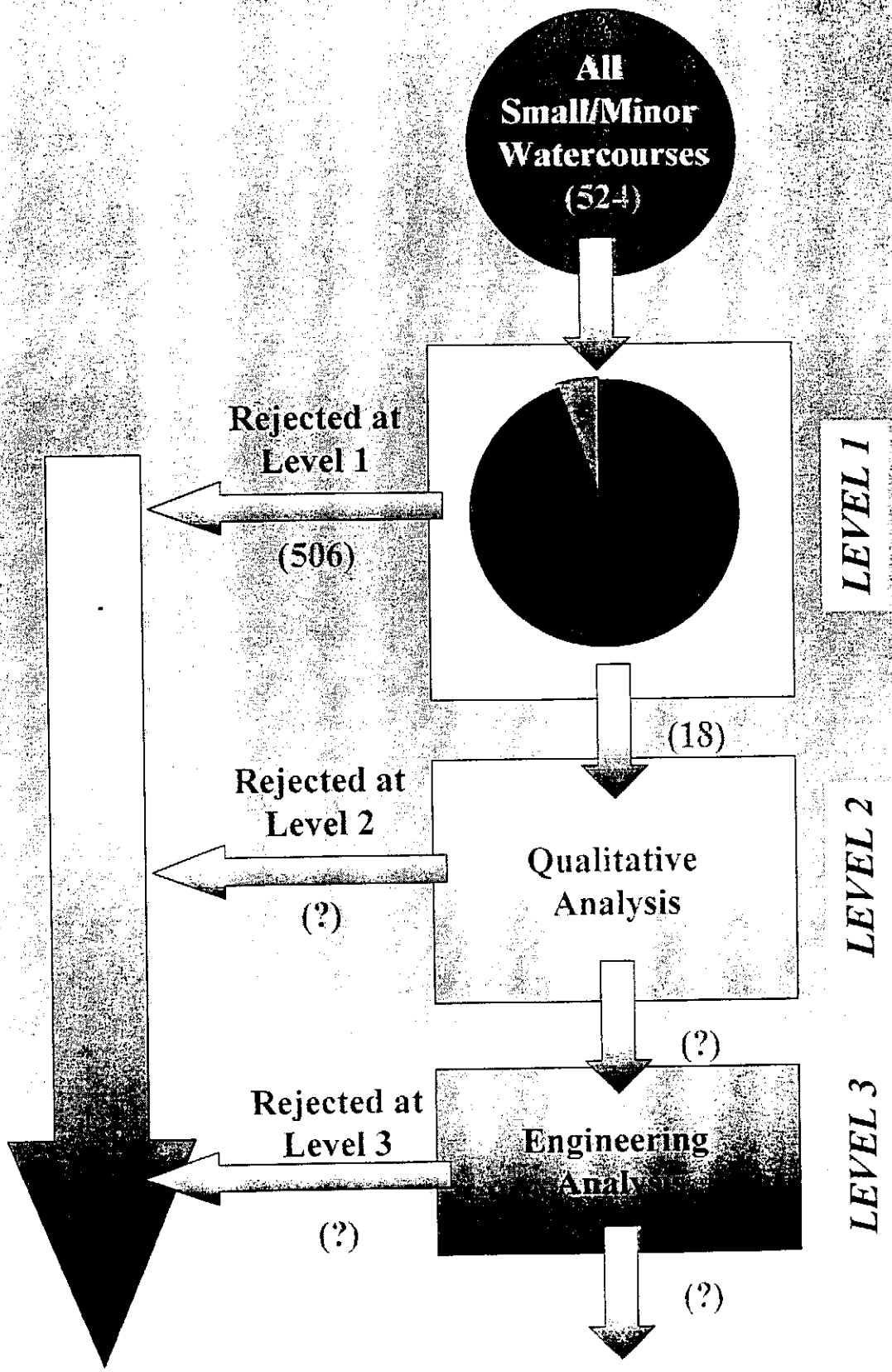
Watercourse Evaluation Analysis

for Santa Cruz County



Watercourse Evaluation Result

for Santa Cruz County (after Level 1 Analysis)



Watercourse Evaluation Result

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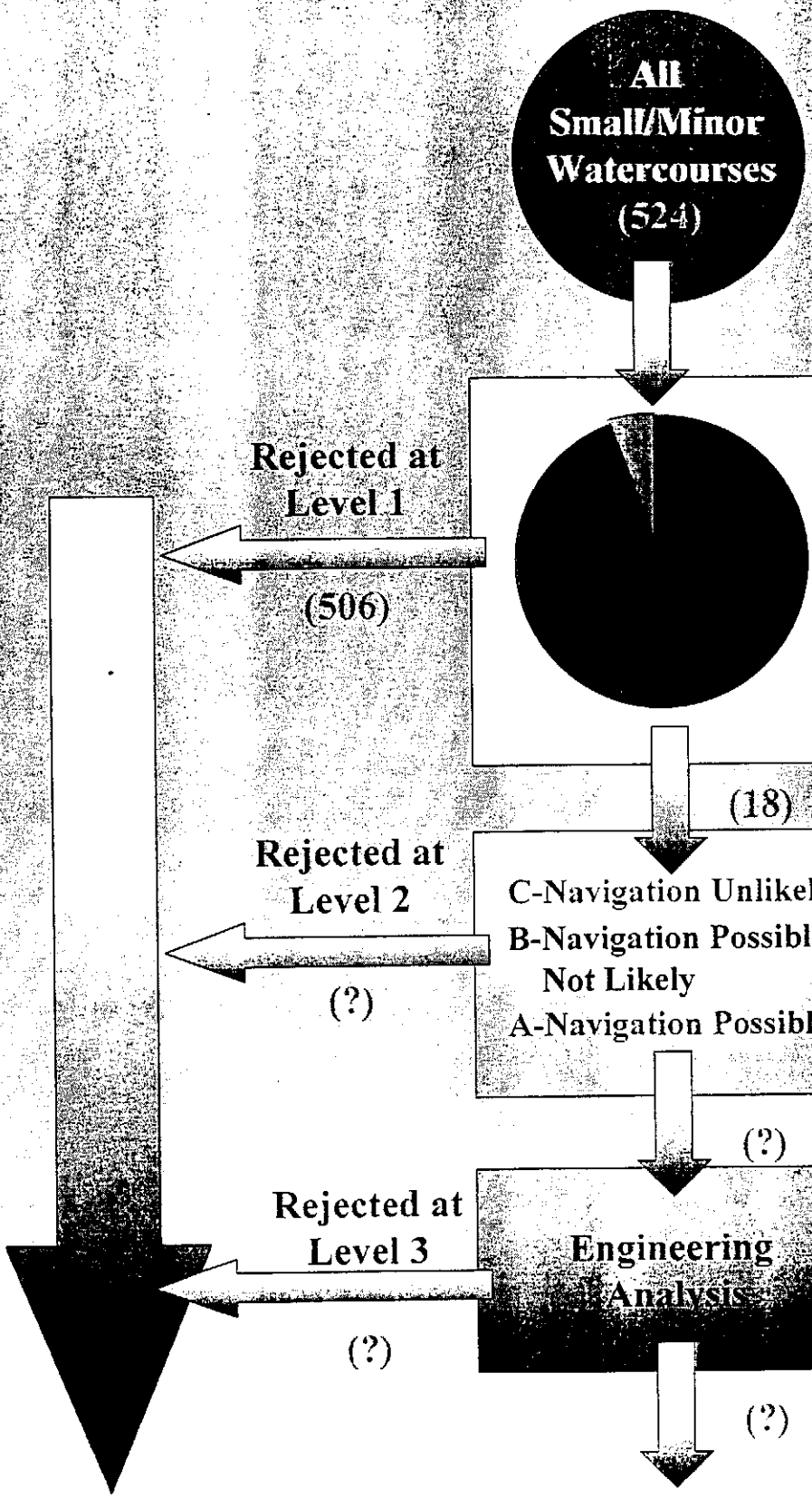

Watercourse Evaluation Result

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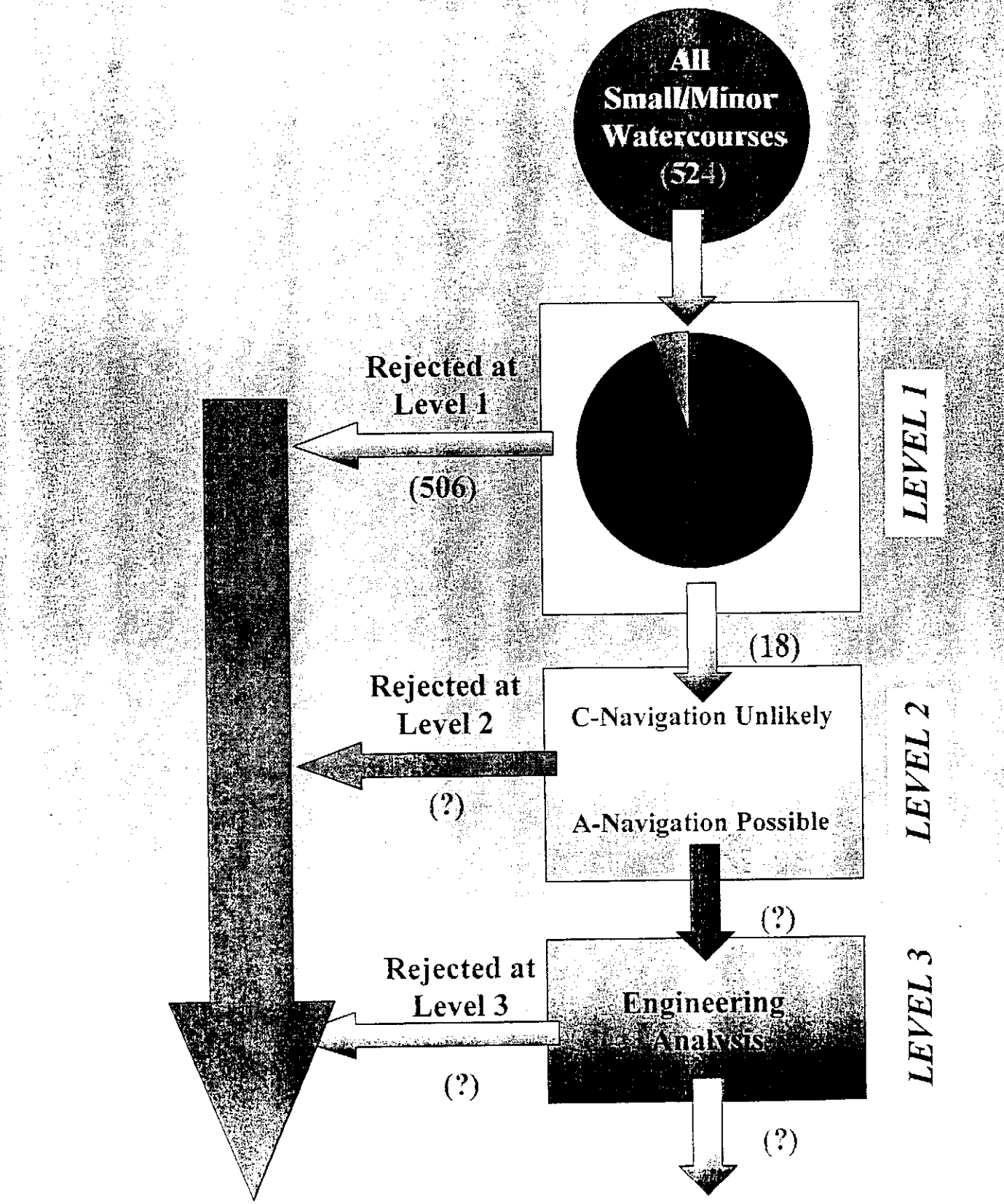
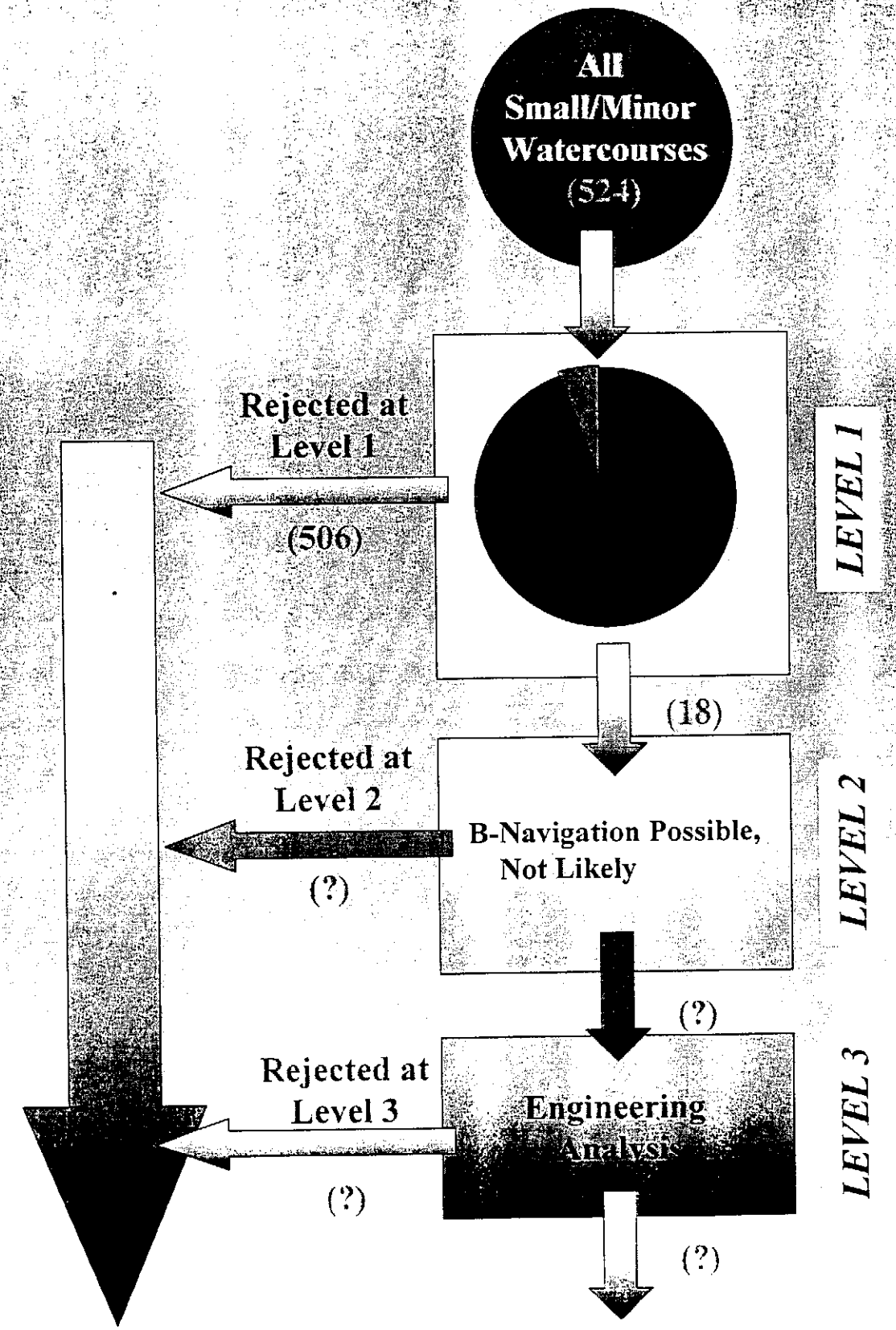


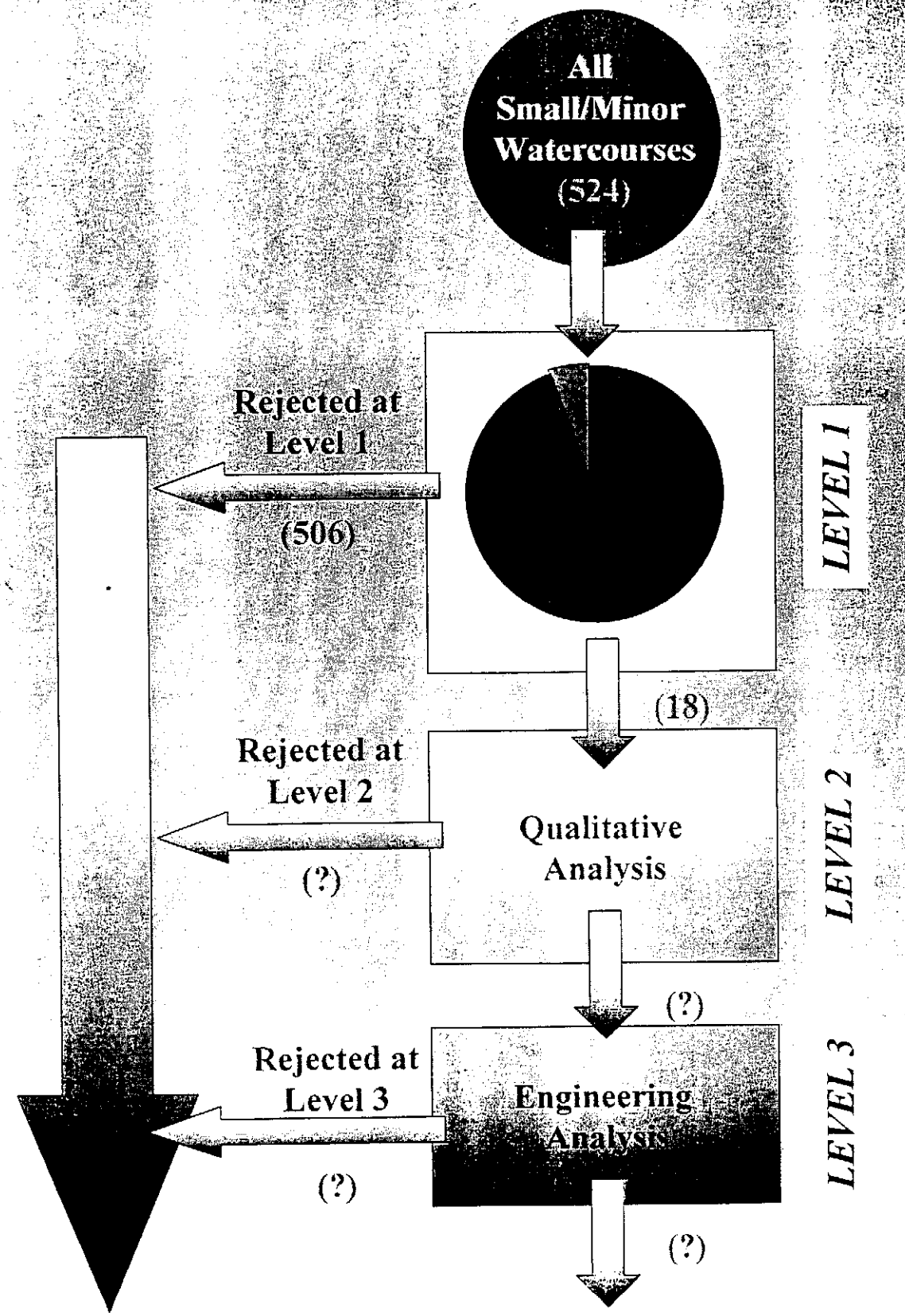
Watercourse Evaluation Result

for Santa Cruz County (after Level 1 Analysis)



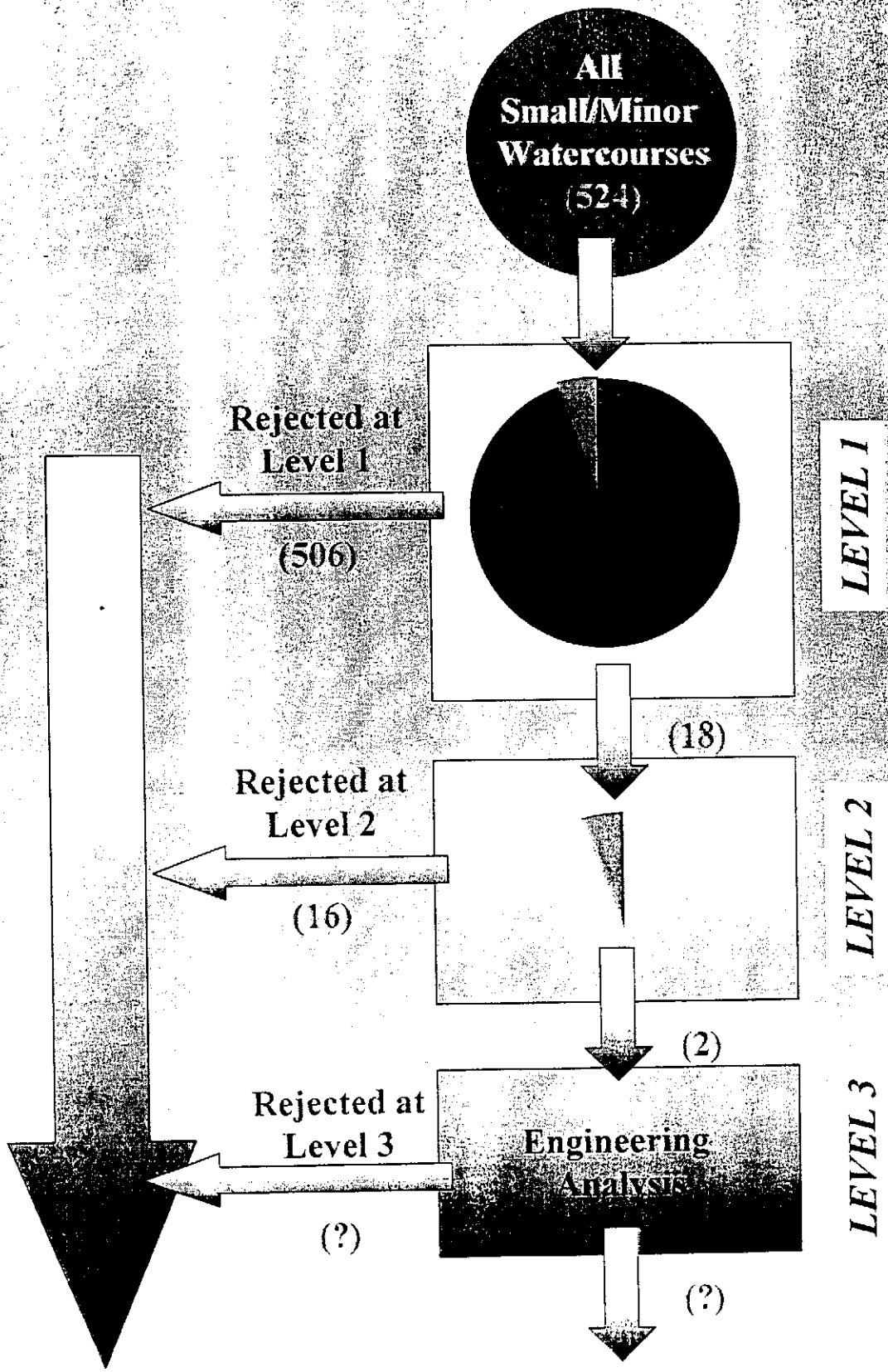
Watercourse Evaluation Result

for Santa Cruz County (after Level 1 Analysis)



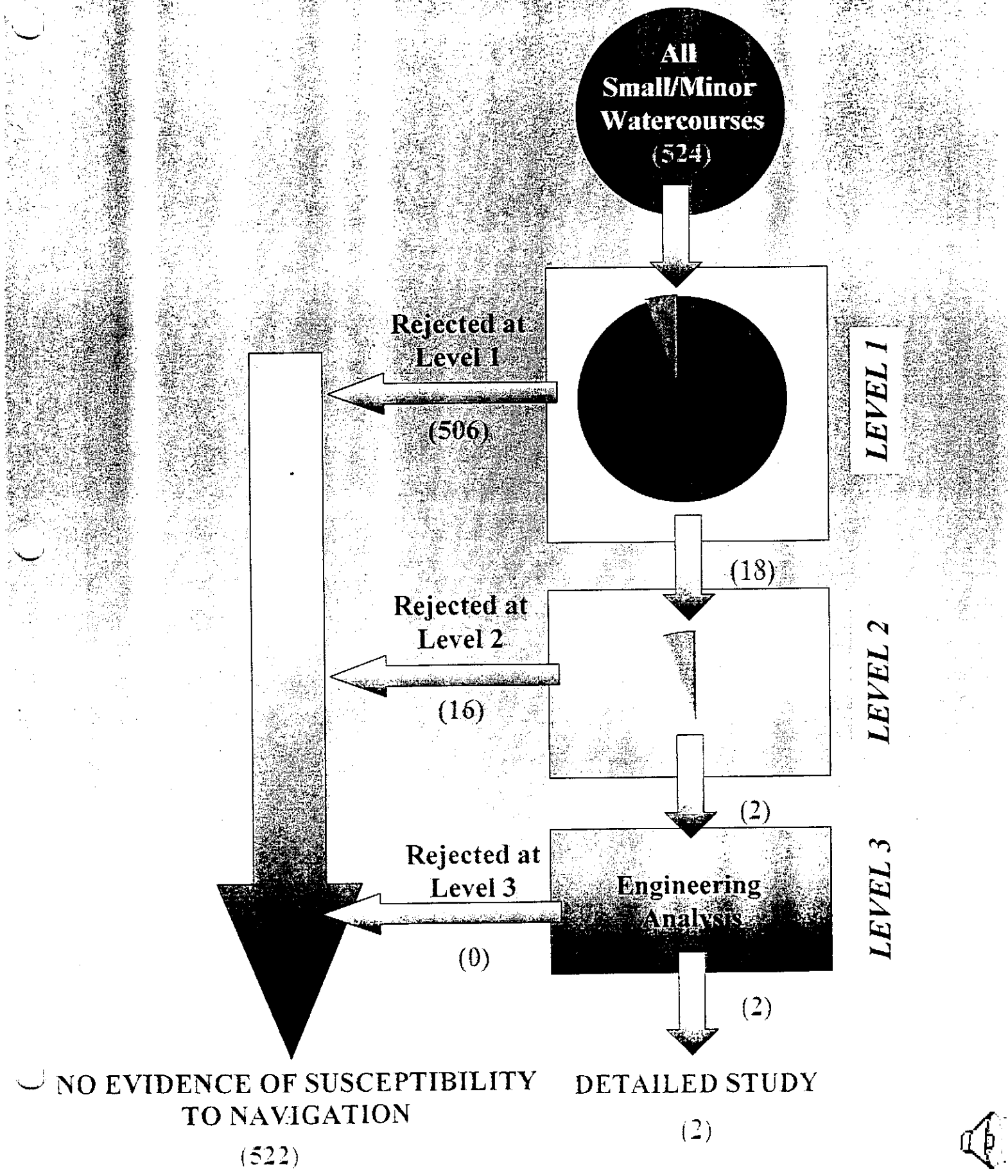
Watercourse Evaluation Result

for Santa Cruz County (after Levels 1 & 2 Analyses)



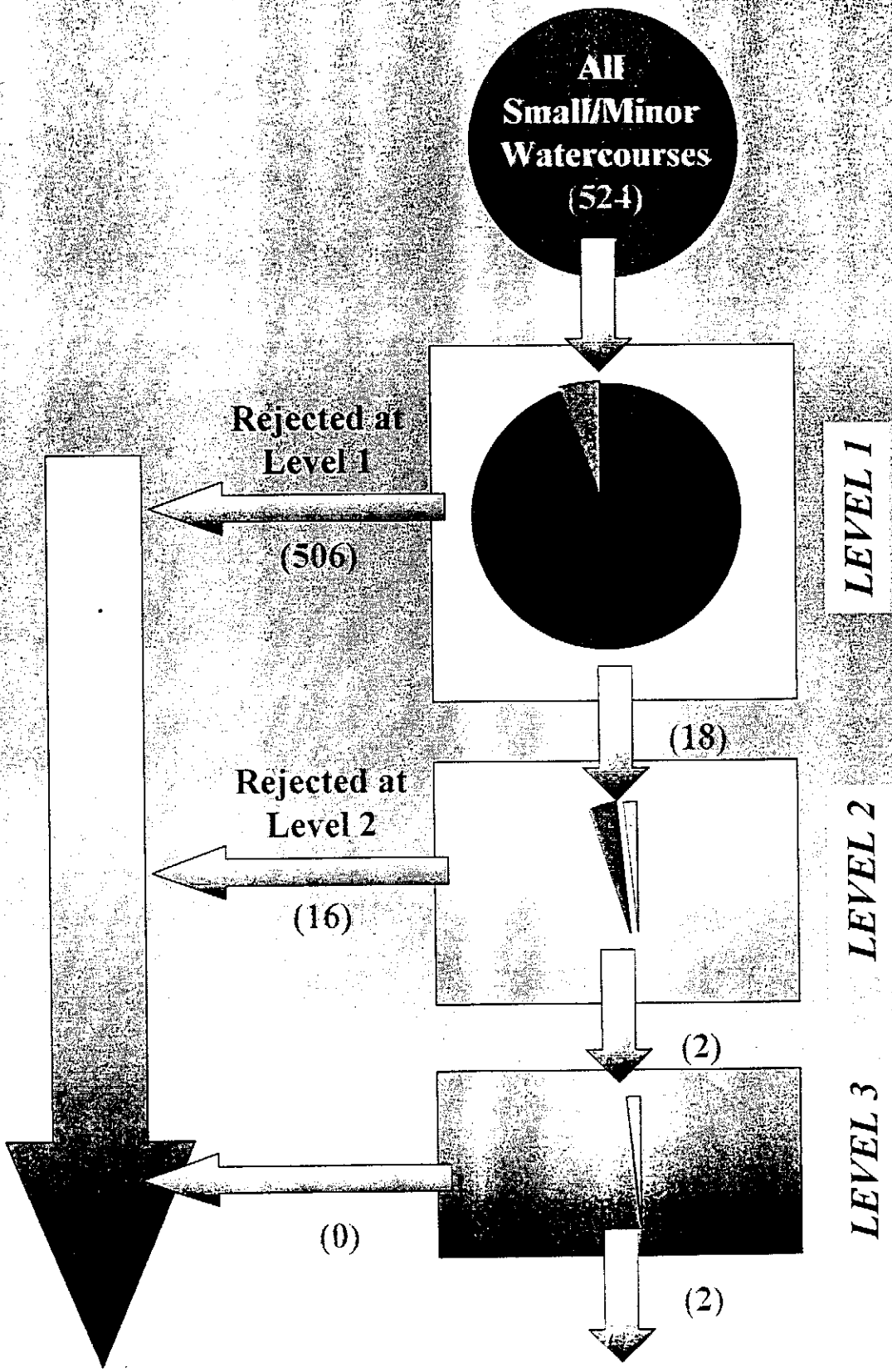
Watercourse Evaluation Result

for Santa Cruz County (after Levels 1 & 2 Analyses)

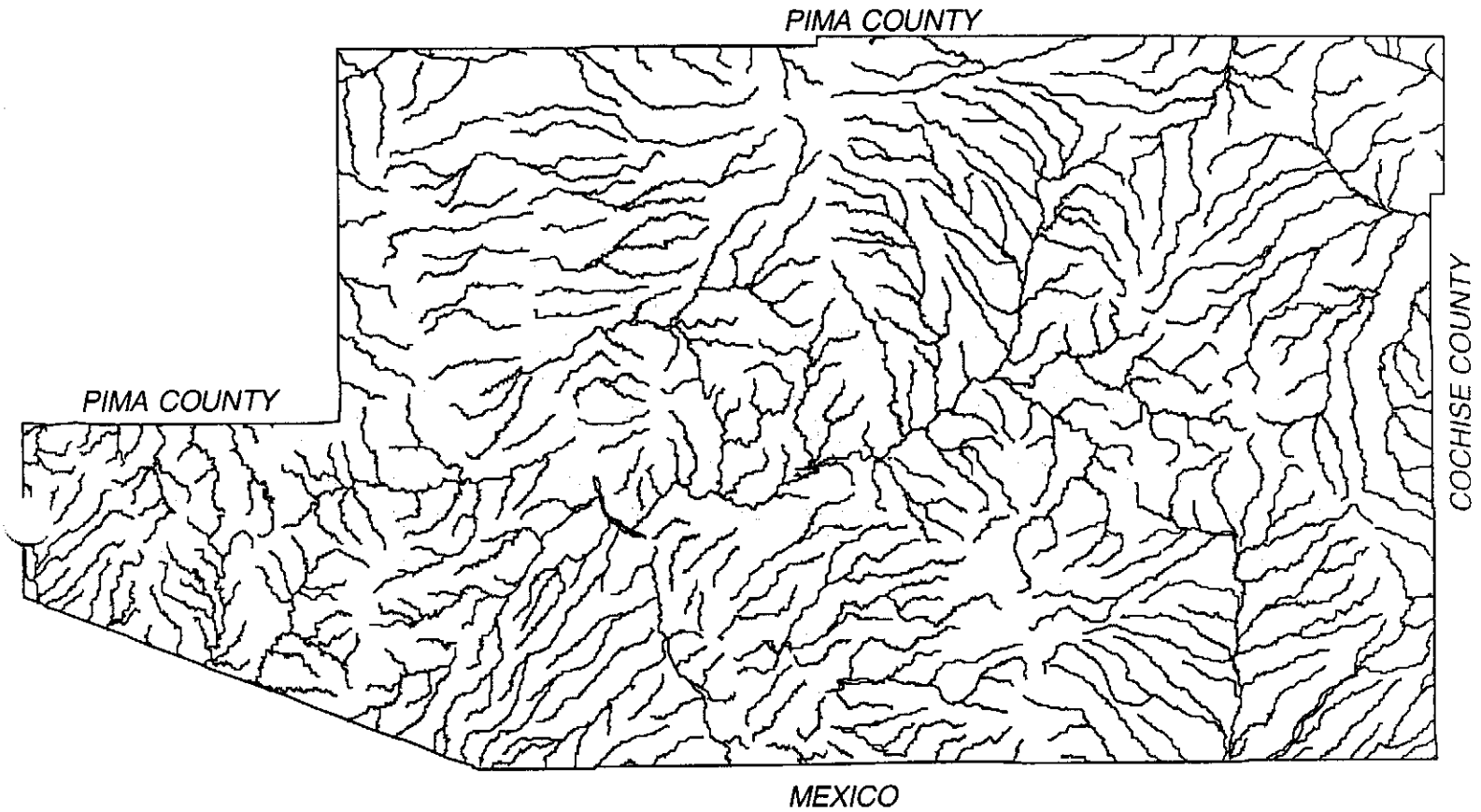


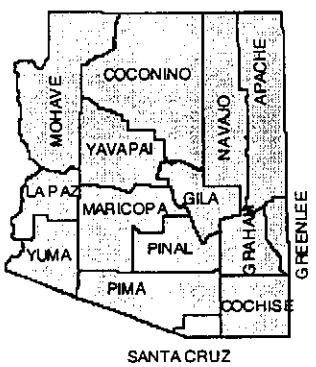
Watercourse Evaluation Result

for Santa Cruz County (after Levels 1 & 2 Analyses)



Small and Minor Watercourses





Arizona Map

LEGEND:

Santa Cruz Watercourses

Santa Cruz County

N

W E

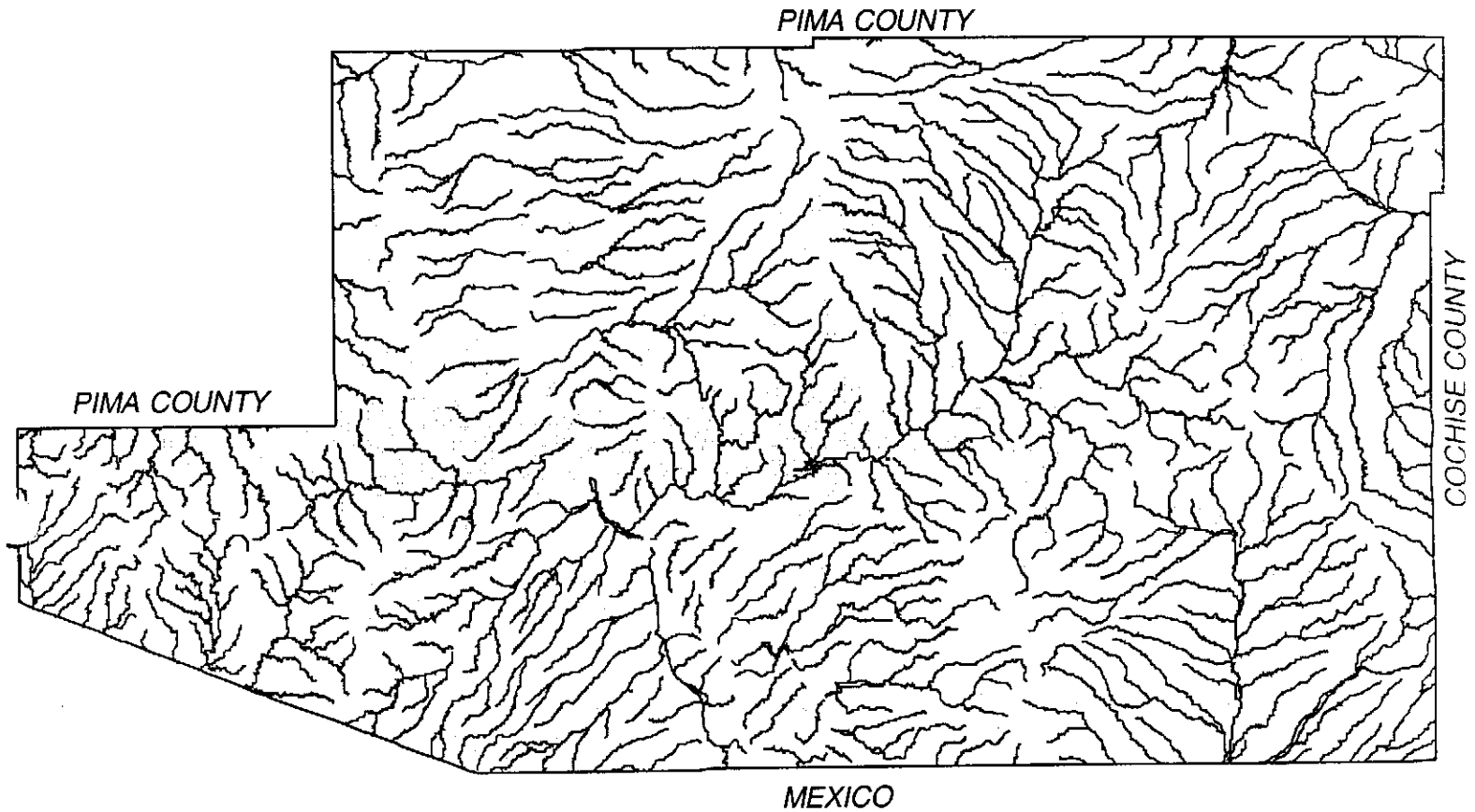
S

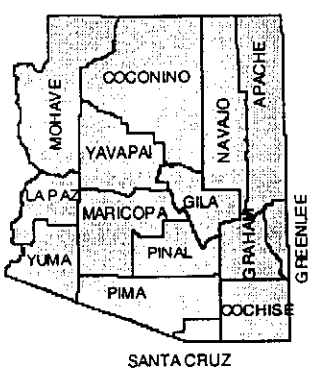
5 0 5 10 Miles

SCALE

Total No. of Watercourses (Santa Cruz): 524

NRL1 and RL1 Data Sets from Level 1 Analysis





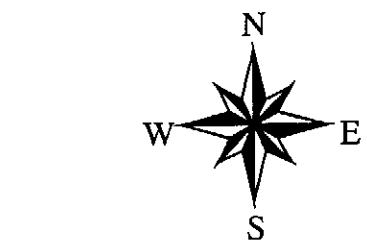
Arizona Map

LEGEND:

NRL1 Data Set

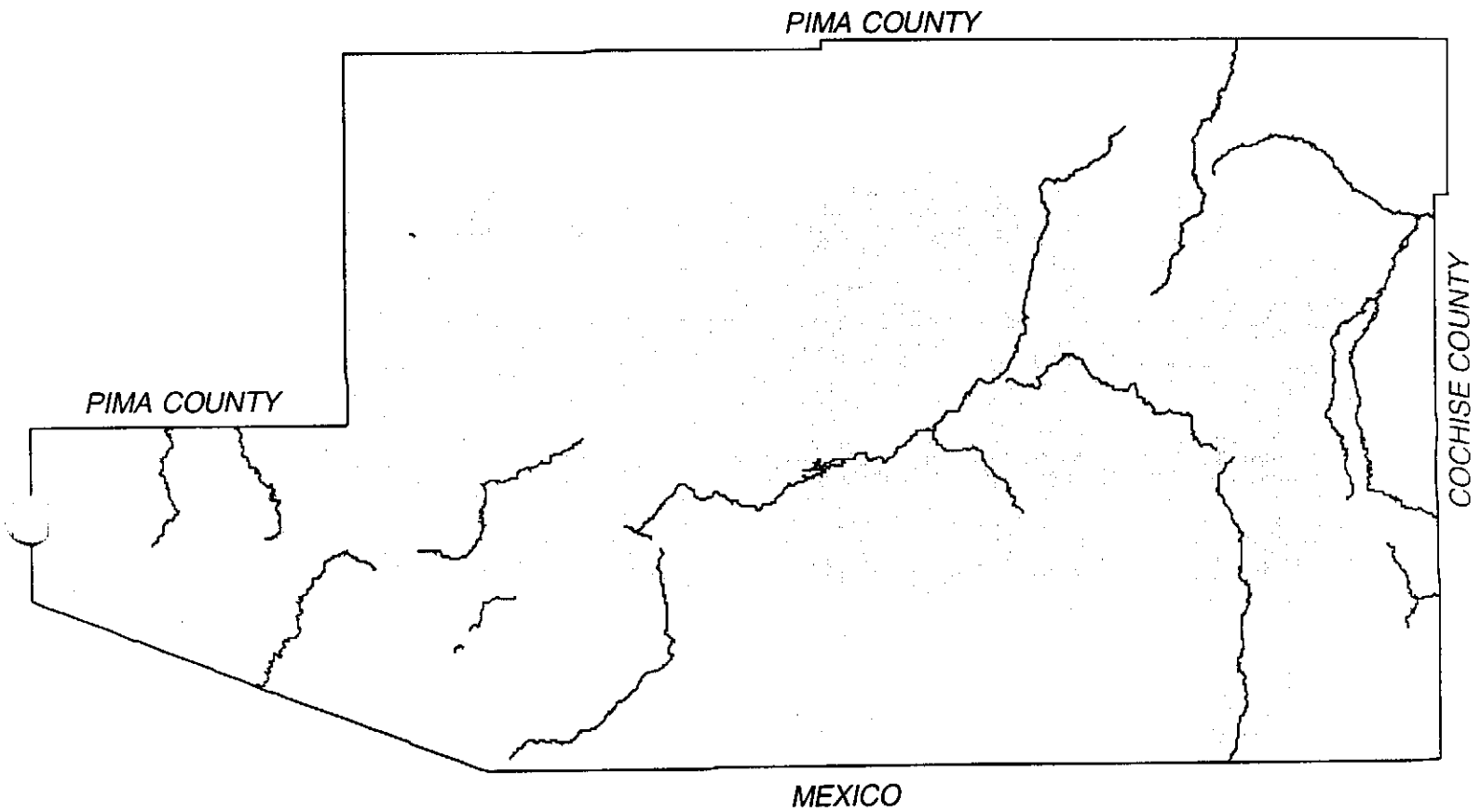
RL1 Data Set

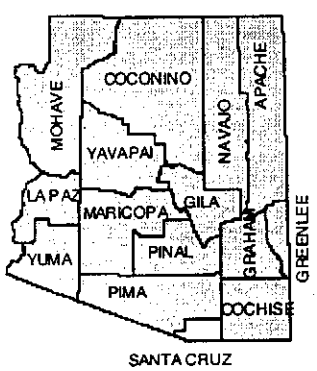
Santa Cruz County



SCALE

NRL2 and RL2 Data Sets from Level 2 Analysis





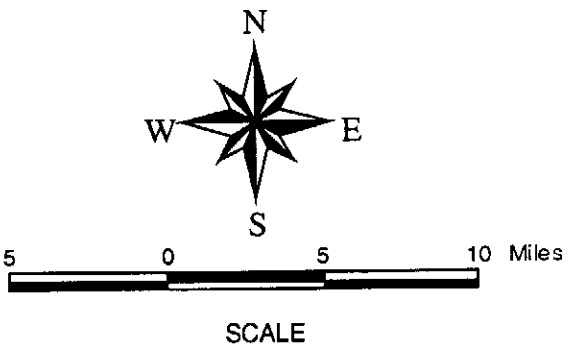
Arizona Map

LEGEND:

NRL2 Data Set

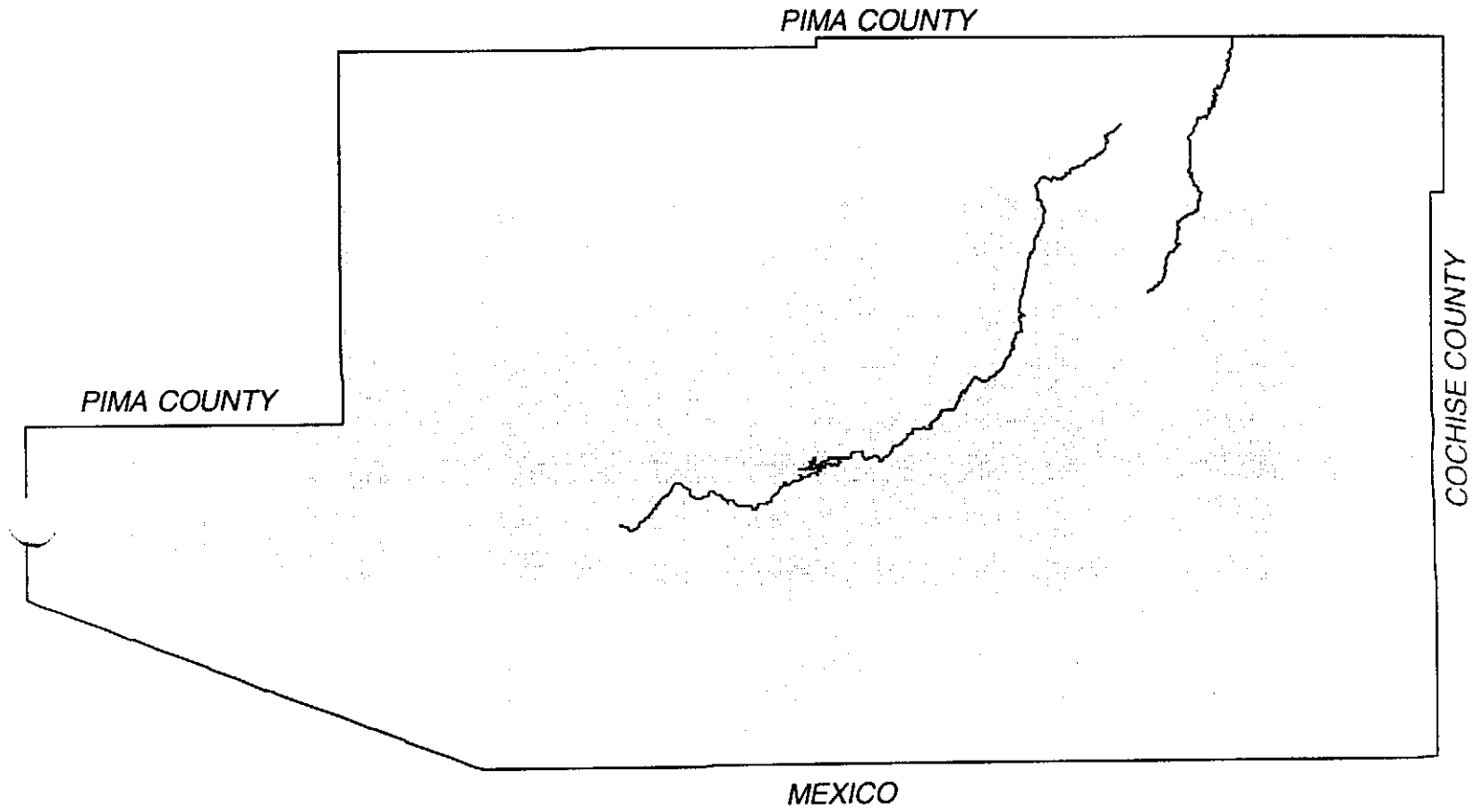
RL2 Data Set

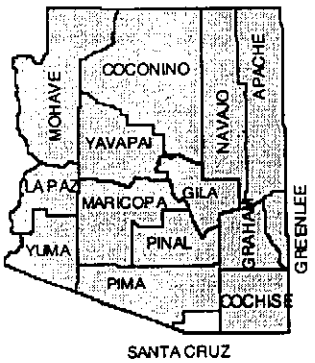
Santa Cruz County



SCALE

NRL3 and RL3 Data Sets from Level 3 Analysis





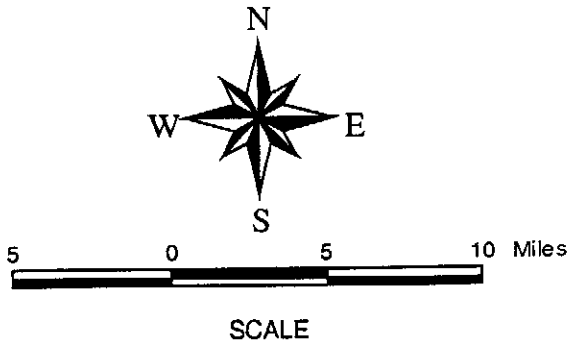
Arizona Map

LEGEND:

NRL3 Data Set

RL3 Data Set

Santa Cruz County



SUMMARY

(1) Small and minor watercourses in Santa Cruz County:

Total:	**524**	
Named:	**26**	**(5.0%)**
Unnamed:	**498**	**(95.0%)**

(2) Level 1 Analysis:

Total:	**524**	
RL1 Data Set:	**506**	**(96.6%)**
NRL1 Data Set:	**18**	**(3.4%)**

(3) Level 2 Analysis:

Total:	**18**	
RL2 Data Set:	**16**	**(88.9%)**
NRL2 Data Set:	**2**	**(11.1%)**

(4) Level 3 Analysis:

Total:	**2**
RL3 Data Set:	**0**
NRL3 Data Set:	**2**

(5) For Detailed Study:

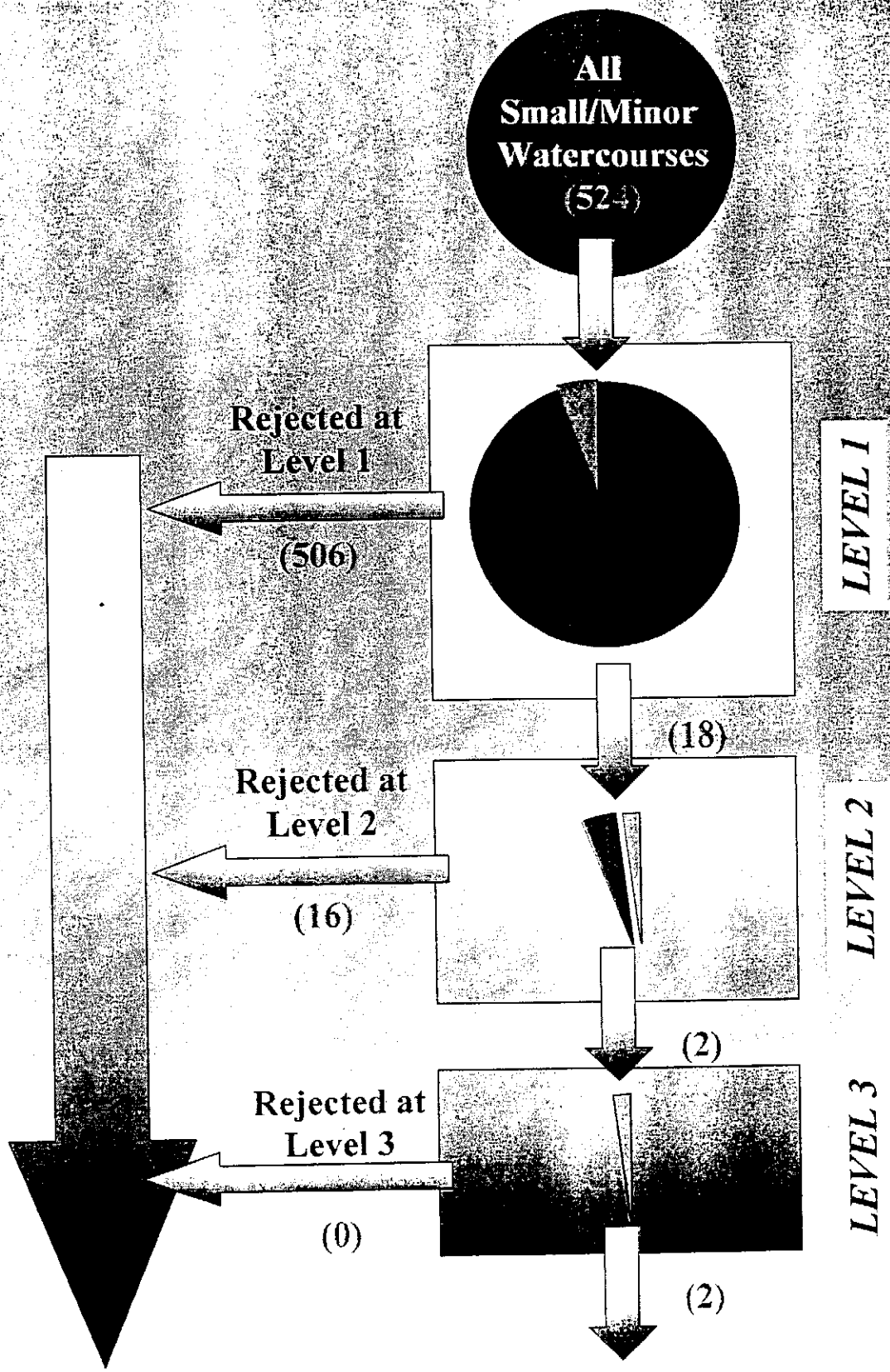
Total:	**2**

(6) Watercourses not susceptible to navigation:

Total:	**522**

Watercourse Evaluation Result

for Santa Cruz County (after Levels 1 & 2 Analyses)



ANSAC Public Hearing

Santa Cruz County

END OF PRESENTATION

Stantec Consulting, Inc.
Phoenix, Arizona
In association with:
JE Fuller Hydrology & Geomorphology, Inc.
Tempe, Arizona