Lyonothamnus floribundus ssp. *floribundus*
Photos from FG 9525, Catalina Ironwood protection on
Santa Catalina Island, by Catalina Island Marine Institute

[redacted]

12

10

11

7

8

9

5

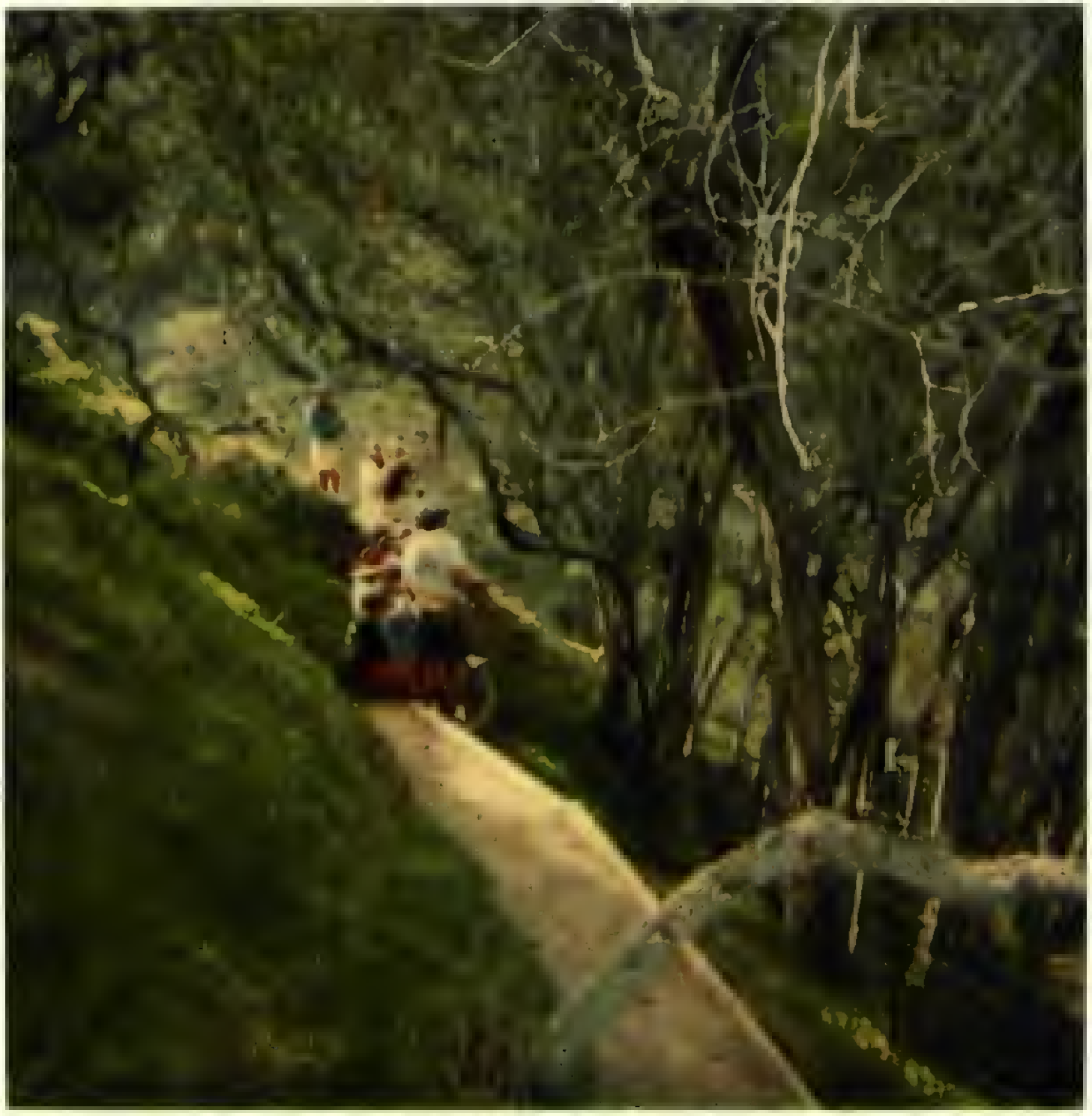
6

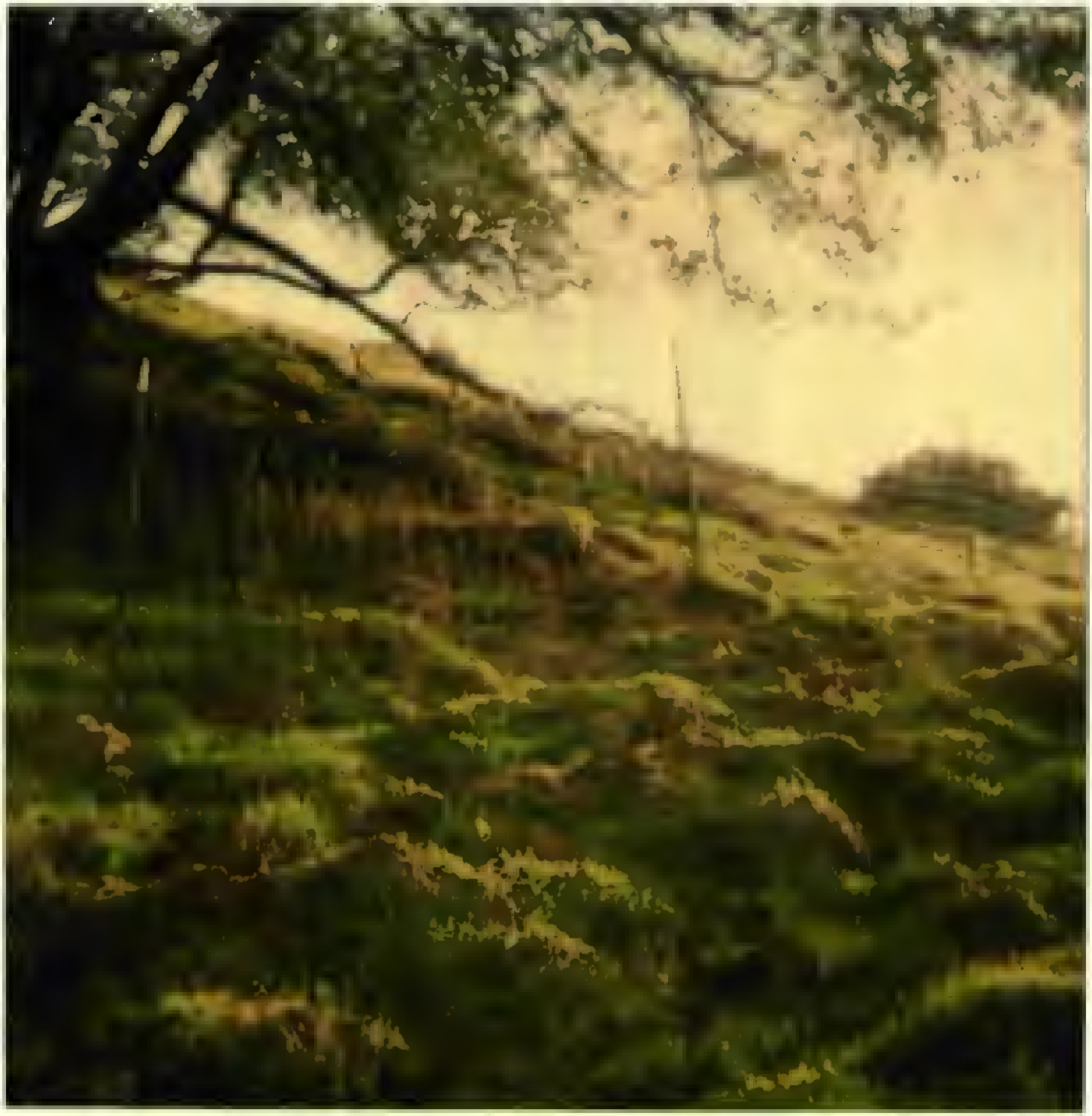
4

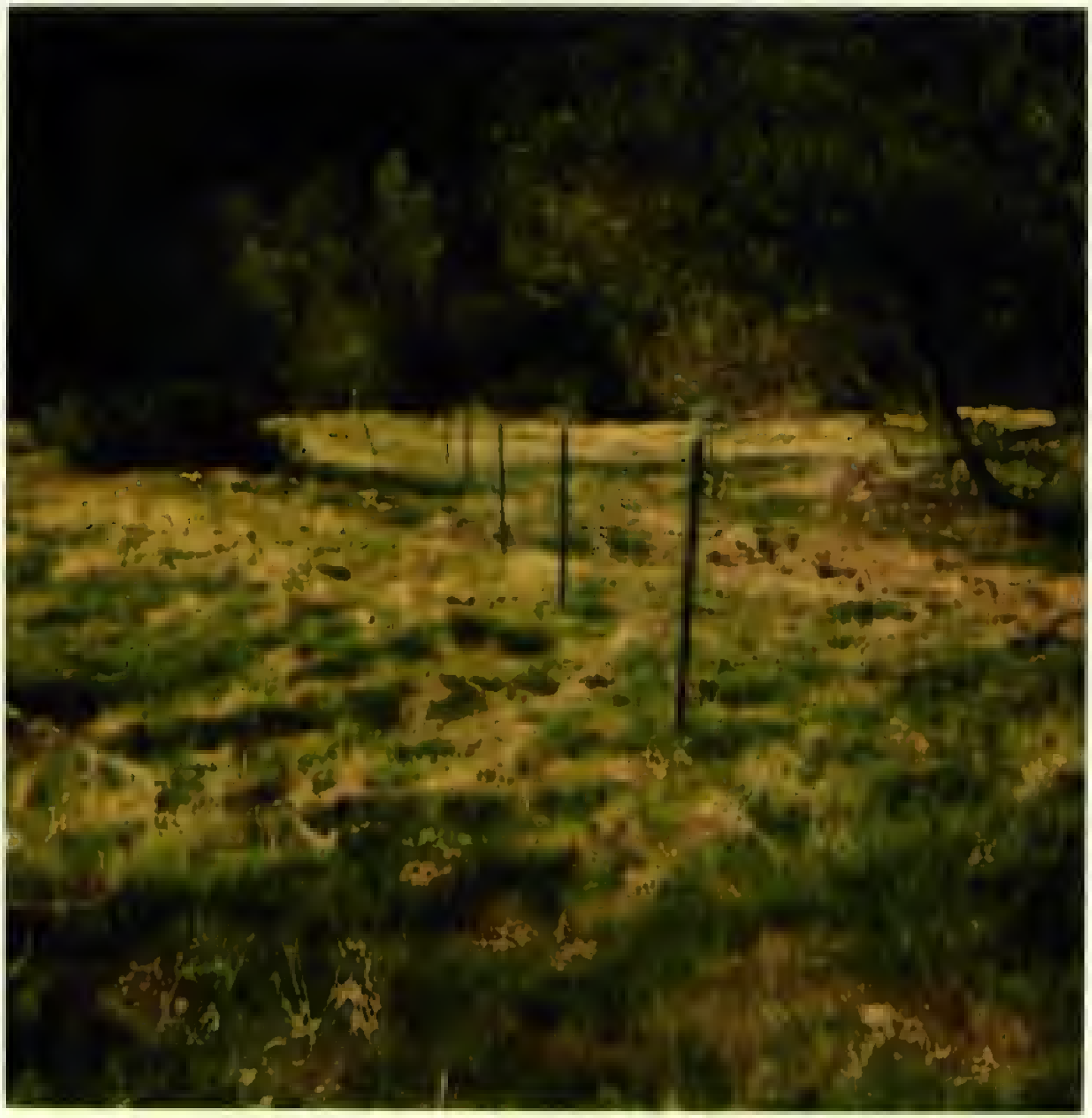
1

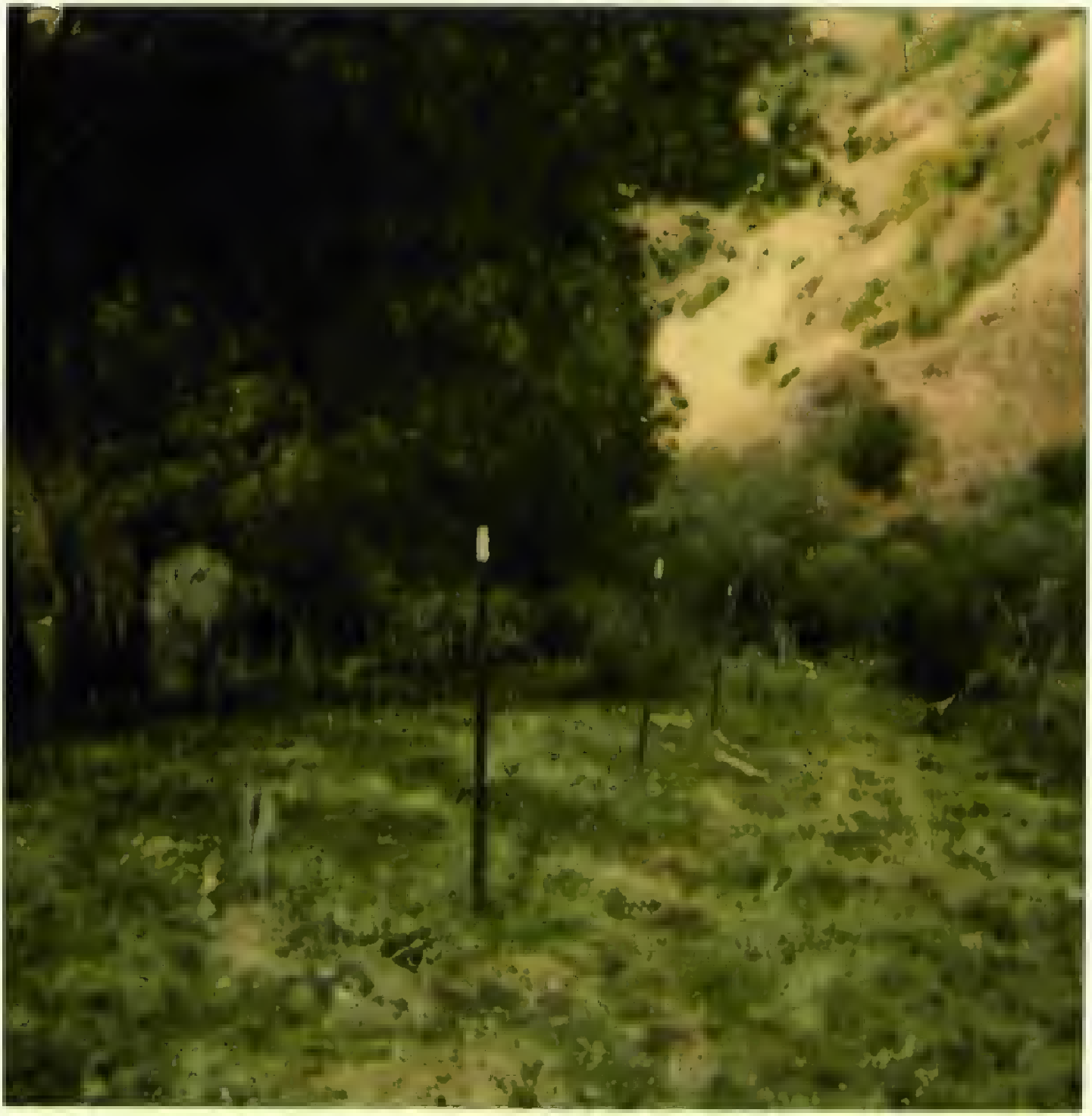
2

3

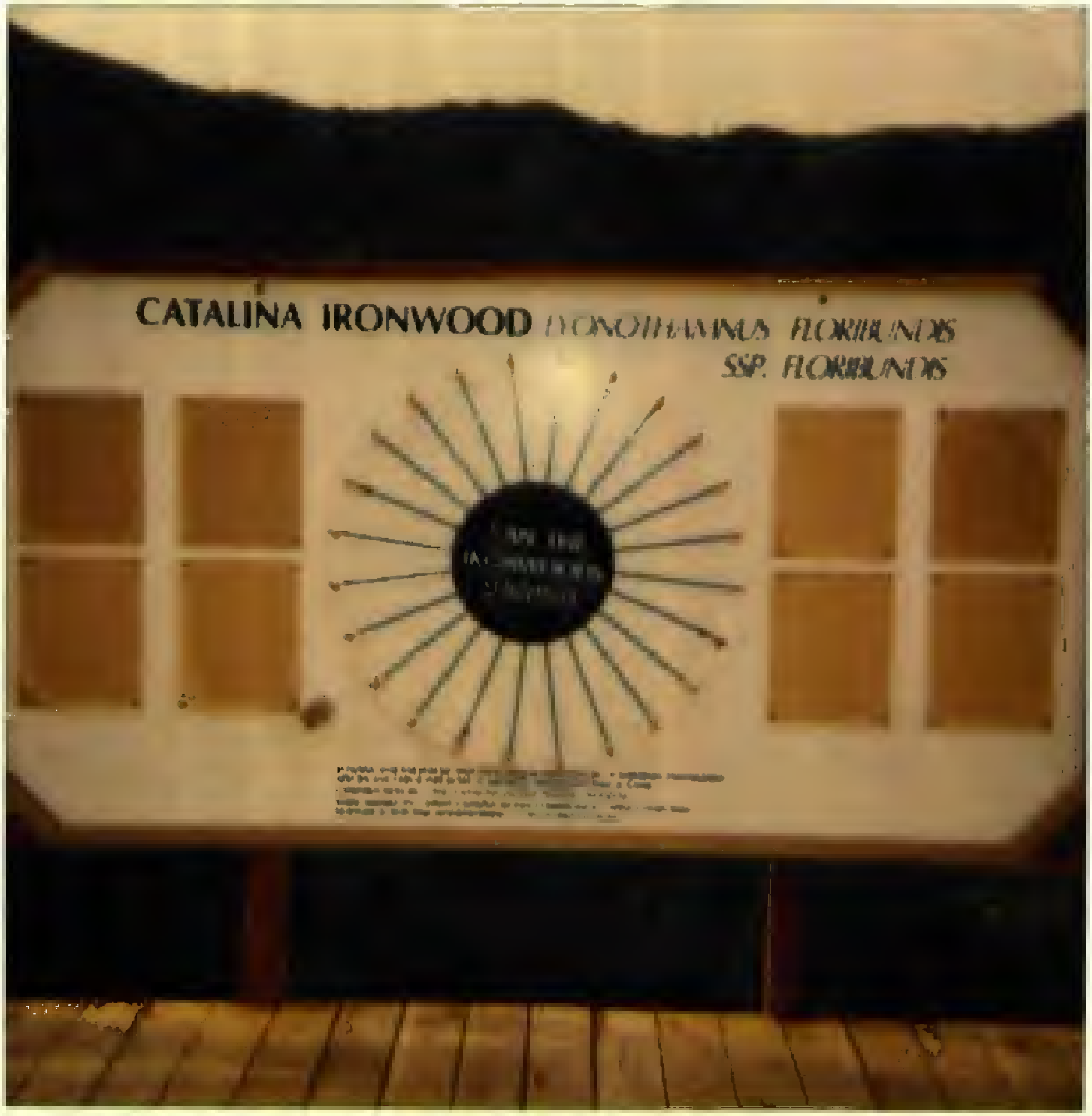








6


CATALINA IRONWOOD

10


CATALINA IRONWOOD

Lyonothamnus floribundus ssp. *floribundus*
Photos from FG 9525, Catalina Ironwood protection on Santa Catalina Island, by Catalina Island Marine Institute

[redacted]

Ironwood Grove March 25, 1992 Report

This is a report of the current (March 19, 1992) conditions at the Ironwood *(Lyonothamnus floribundus var. floribundus)* Tree study grove found at Toyon Canyon on Santa Catalina Island.

Study grove has 90% (visual estimate) ground cover inside, mostly composed of grasses standing an average of 10-16" in height (see photo's #6,#7, & #8). Other plants (annuals and perennials) that were observed on one cross transect are:

Thysanocarpus curvipes	Lacepod
Marrubium vulgare	Horehound
Claytonia perfoliata	Miners lettuce
Pteridium aquilinum	Bracken Fern
Pholistoma racemosum	White Fiesta Flower
Galium sp.	Bedstraw
Rhus integrifolia	Lemonadeberry
Marah macrocarpus	Wild Cucumber
Rumex sp.	Dock
Dichelostemma pulchella	Blue Dicks
Amsinckia intermedia	Fiddleneck
Prunus lyonii	Catalina Cherry (4 seedlings)

The exclosure was in good shape and there is <u>no evidence</u> of animals ever breaching the fence. There is evidence of animals walking around the outside of the fence. As of this date the ground cover outside the exclosure is 10-20% (visual estimate) less than within the exclosure. Most basal sprouts were 1-4" in height (see photo's #11 & #12). Many of the basal sprouts appear to have declined or become dormant. The control trees outside the grove were grazed back in the Fall of 1991.

There is a grove of 200+ trees about 1/8 of a mile directly across (west) the canyon from the study grove. This grove is not protected in any manner. A quick visual survey of that grove showed less than 25% ground cover (visual estimate) within the grove (see photo's #9 &#10). Most of the cover was various grasses and a small amount of:

Claytonia perfoliata	Miners lettuce
Pteridium aquilinum	Bracken Fern

These were the only annuals / perennials that were observed. This grove showed just the beginning of basal sprouts (1/4"-1") on a minority of the trees (see photo #13). The understory was mostly loose, bare soil and Ironwood leaf litter. This area rarely sees human activity and is frequented by animals upon a regular basis.

Of note:

I visited a grove of 100+ trees known as the Long Beach Yacht Club Grove on the West End of the island above Howlands Landing on March 15, 1992. This grove has been free of grazing herbivores for approximately the past two years. I was impressed by the size and number of basal sprouts. Most trees had basal sprouts (often 30+) and they appeared to be 24-36" in height. This was an average. The ground cover was good, maybe 50-75%. I was told by Doug Probst (Conservancy President) that the basal sprouts in this grove were about the same size last year. No sprouts were evident before the removal of the feral herbivores two years earlier.

Conclusions:

It would appear that the study grove has dramatically increased its ground cover in density and species. When the study proposal was written, the ground cover in the study grove appeared very similar to the grove surveyed across the canyon (sparse and mostly leaf litter). However, the ground cover has also increased dramatically in this location on the outside of the exclosure. Since we have increased the human activity in this area, it appears that the feral animals have stayed away somewhat (especially the goats). Human damage has been reduced significantly with the reworking and re-routing of the trail. The old trail is +50% grown over with grasses and annuals. The soil within the grove is stable and secured by the thick understory.

The basal sprouts are continuing to increase as the previous reports have indicated. It is still too early to form any conclusions towards their significance. The basal sprouts appear to be growing slowly, especially in comparison with some other groves on the island. At this time (March 92), many sprouts appear dormant, injured, or non existent. The trees are just beginning to start their spring growth. These next two summers may

prove to be the most interesting as we watch for developments. Some of the basal sprouts are being choked out by the grasses now within the grove. Damage in the form of grazing occurred upon the basal sprouts on the control trees outside the grove on two separate days.

Public awareness of the Ironwoods and this grove has increased greatly. We have had 12,000 + students visit this grove and participate in the review at the interpretive display. They have learned much about the trees, the importance of trails, and the inter-relationship of all the species that are found at the grove. Steve Bennet has begun and is continuing a study of the mites within the leaf litter found in and outside of the grove.

We have offered four classes over the past two summers to study the grove and will continue these classes each summer. Over 20 students have participated in these studies and learned detailed specifics about the grove as well as botanical study methods.

The Catalina Conservancy has begun (February 92) the eradication of all goats and pigs within this canyon (I would estimate 90% of the goats have been removed and 50% of the pigs at this time). There has already been observed recovery and less pressure on the plants in these areas. Unfortunately, introduced deer and bison will still be allowed to roam freely.

Overall, the exclosure has been a great success. The trees have been successfully protected, trails in the area have been improved to reduce damage and erosion, and thousands of students and adults have become more aware of the need to protect and study our native and endangered plant species. With the removal of goats and pigs from the area there is hope for other groves. However, it has been our observation that much damage occurs by a few animals grazing heavily for a few hours. It is not known whether deer or bison feed upon these trees. This exclosure and study may provide valuable clues and insights for many years to come. Our hope is to continue to gain more knowledge and stimulate more studies and preserves for these trees.

Description of photo's (All photo's March 19, 1992)

1. View of the study grove looking towards the East. Group of students on trail leading to the grove. Notice angle of slope.

2. Students on the outside of the grove learning about and seeing the trees up close.

3. Students at the interpretive area having a review with the "wheel of fortune" on which they spin to see if they would survive if they were an Ironwood Tree.

4. Interpretive deck with feral pig damage showing under oak trees.

5. View of the study grove from the interpretive deck looking west. Notice the feral pig damage near the gully on the way to the grove.

6. Ironwood exclosure. Fence in good shape.

7. Ironwood Grove with groundcover inside and outside the exclosure.

8. Groundcover inside the study grove.

9. Groundcover at Ironwood grove (no exclosure) west of study grove (across canyon).

10. Groundcover at Ironwood grove (no exclosure) west of study grove (across canyon).

11. Basal sprouts on tree within study grove.

12. Basal sprouts on damaged tree within study grove.

13. Basal sprouts at Ironwood grove across canyon.

TREE #	DBH	Basal Sprouts 90	sprouts 91	Comments	Roots Exposed 2	March 17 1992
1	6.6	3	6	NEAR TRAIL(NT)	N	
2	5.1	1	3	NT	Y	3
3	3.1	1	2	NT,DEAD(D),WOOD PECKERED(WP)	Y	
4	7.2	8	26	NT	Y	
5	6.3	1	4	NT	Y	
6	2.7	0	0	Control tree	N	0
7	8.15	0	0	NT Control tree	Y	0
8	7.7	0	1	NT	Y	
9	10.6	0	5	NT	Y	3
10	4.75	0	0	D	Y	
11	3.4	0	0		Y	
12	7.5	0	0		N	
14	12.7	5	18		Y	
15	7.0	3	15	CONTROL(C),NT	Y	3
16	3.5	0	4	C,NT, D	Y	0
17	5.5	0	17	C,NT	Y	
18	5.25	6	13 ***	Control tree outside exclosure	Y	7
19	4.7	0	4		N	
20	2.85	0	0	C,NT	N	
21	9.6	4	16		Y	
22	11.2	0	0		Y	
23	3.95	1	5		N	
24	4.5	0	0	NT	N	1
25	7.8	3	5	NT	N	7
26	9.65	8	17		Y	
27	2.9	1	1		Y	0
28	4.25	0	2		Y	2
29	8.1	20	42	C,NT	Y	
30	6.0	0	7	NT	Y	
31	5.75	1	*	NT	N	
32	10.35	0	1		N	0
33	10.0	0	0		N	
34	9.3	0	0		Y	
35	10.6	0	0		N	
36	15.6	67	74	TOPPED	Y	
38	5.5	1	*	NT	Y	
39	5.0	0	6	NT	N	
40	3.9	0	4	NT,WP	Y	

TREE #	DBH	Basal Sprouts 90	sprouts 91	Comments	Roots Exposed 2	March 17 1992
41	5.6	0	7	NT	N	7
42	5.5	1	9	NT,C	Y	
43	3.5	0	13	NT,C	Y	
44	3.8	3	1	NT,WP	N	0
45	4.6	0	1	NT	N	
46	5.6	0	0	NT,WP	N	0
47	5.2	0	5	NT	N	5
48	4.5	2	4	NT	N	6
49	3.2	0	0	NT	N	0
50	5.3	1	2		Y	
51	2.3	0	3		Y	
52	8.6	11W	33	NT,C	Y,HEAVILY	27
53	6.0	4	11		Y	
54	7.0	31	78	TOPPED	Y	
55	4.3	1	5		Y	
56	5.6	9	*		Y	
57	2.2	0	*		N	
58	2.5	0	*		N	
59	4.9	5	1		N	
60	1.8	0	0	NT,WP,D	Y	
61	4.0	1	6		Y	4
62	5.8	0	2		Y	1
63	5.2	3	8	NT	Y,HEAVILY	
64	3.8	12	9	NT,FALLING	Y,HEAVILY	
65	5.1	9	38	NT	Y,HEAVILY	34
66	5.0	0	4	NT	N	
67	6.45	3N	3		Y,HEAVILY	0
68	3.1	1	5		Y,HEAVILY	
69	2.5	0	3		Y,HEAVILY	
70	3.3	0	3		N	
71	5.1	12N	22		N	
72	5.1	2N	1		Y	
73	5.6	1W	3	NT,WP	N	
74	6.2	0	2		Y	
75	3.6	0	0		Y,HEAVILY	
76	5.2	0	0		Y,MEDIUM	
77	5.0	0	0		Y,MEDIUM	
78	6.0	0	1		Y	

TREE #	DBH	Basal Sprouts 90	sprouts 91	Comments	Roots Exposed 2	March 17 1992
79	7.5	0	0		N	
80	5.5	2W	2		N	
81	13.8	0	3	OLD	Y,HEAVILY	
82	7.2	0	0		Y,HEAVILY	
83	3.4	0	0		Y,VERY HEAVILY	
84	5.0	0	2		Y,VERY HEAVILY	
85	5.7	3N	7		Y,MEDIUM	
86	3.0	8	13		Y	
87	3.1	13W	13 ***	WP Control tree outside exclosure	Y,HEAVY	12
88	5.0	0	0		Y	
89	5.7	1	4		Y	
90	5.0	1	12		Y	
91	5.0	0	5		Y	
92	6.5	4	15		Y	
93	5.2	2W	7 ***	Control tree outside exclosure	Y,MEDIUM	
94	3.1	2W	3		Y	
95	3.5	5W	4		Y	
96	8.0	1N	10		Y	
97						
98	2.9	2	8		Y	
99	6.0	1	5		N	
100	4.7	1	2		Y	1

Article to appear in the April 3, 1992 Catalina Islander newspaper.

Helping Catalina Ironwood trees!

California Taxpayers have helped sponsor a study of Ironwoods at the Catalina Island Marine Institute, helped fund the Bald Eagle Restoration program on Catalina, have funded protection and study of the extremely rare Catalina Mahogany, and have helped fund research on the Island Foxes. You can help the Ironwoods and many other rare plants and animals by making a contribution on your California Resident Income Tax Return. Line 50 is the Rare and Endangered Species Preservation Program. A contribution to this fund will directly help Catalina and other areas in California. As you can see this fund has been an important method of helping some of our unique island species.

A contribution to this fund will make a difference. The Ironwood study at the Catalina Island Marine Institute (Toyon Bay) is a continuing program that includes an animal exclosure, monitoring of 100+ trees for new growth, and an interpretive area for teaching. Since this study began, over 12,000 students have visited this grove and learned more about Ironwoods and the ecological role they play on this island. Some of the results of the study have indicated that Ironwoods are damaged extensively by introduced animals and that when protected they can quickly sprout new growth. By excluding introduced animals from the grove at Toyon we witnessed a 138% increase in new growth (basal sprouts) in just one year. There are 24 trees which previously lacked any sprouts that are now showing new growth.

The Rare and Endangered Species Preservation Program has directly helped our Island. When you send in your taxes please add a contribution to Line 50. If you would like to know more about the Ironwood study at the Catalina Island Marine Institute or the Rare and Endangered Species Preservation Program call Chris Bartel at 510-1622.

Photo: CIMI instructor Beth Sugaski with students from Hermosa Valley School at the Ironwood "Wheel of Fortune."

Catalina Ironwood Grove protection site on Catalina Island.
Contract: FG 9525 Catalina Island Marine Institute
September 7, 1990

Review: Objective of the contract is to protect a grove of Catalina Ironwood (Lyonothamnus floribundis ssp. floribundis), in Swains canyon on the leeward side of Catalina Island. Approximately 90% of the grove would be enclosed by a fence to keep out exotic grazing herbivores. The enclosure would be maintained and an interpretive board designed for educational use. Monitoring would be on a yearly basis.

METHODS OF MONITORING:

Catalina Sea Camp: An educational research class will be offered each summer (Twice) to study and monitor the grove. All work will be performed by students aged 12-17 with instructor supervision. This will include:

Tagging trees: to identify individual trees for research (numbered metal tags on a loose wire).

Diameter Breast Height: Measured and recorded for selected trees (calipers).

Basal sprouts: observed, counted and recorded for selected trees

Photo documentation: individual trees photographed for latter comparison of changes. (basal sprouts).

Ground cover species identified within enclosure.

Student documentation of work on computer (Apple Macintosh Grant) data base and draftings.

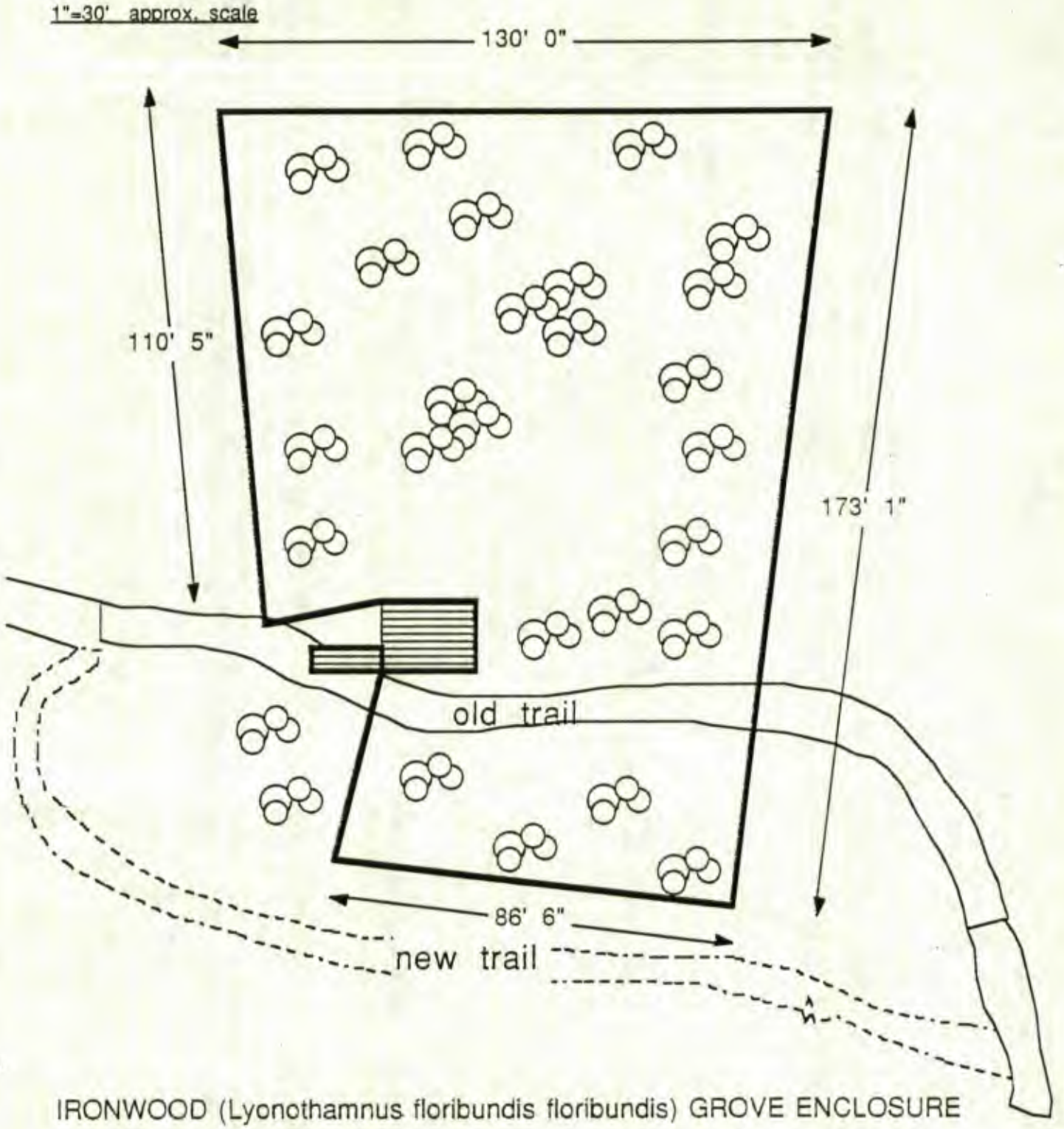
Notes: trees being studied and tagged are near the perimeter of the fence to avoid disturbance of the leaf litter. Because of the steepness of the slope the students are belayed by ropes for safety. The students are involved in the decision process and recording the data.

Catalina Island Marine Institute Instructors: will build and maintain the grove enclosure. Instructors will visit the grove almost daily and visually inspect the fence and use the interpretive board for interactive educational lessons with groups of students. Each year the grove will be photo documented and data recorded for observed changes. The interpretive area will be a deck that will provide seating and several interpretive boards for student interaction. The deck will be located in the grove so that the students can see the trees in their natural location and gain an understanding of island ecology. This interpretive area will be used by 10,000 + students and teachers each year. The interpretative area will be built to fit in naturally and not harming or removing any trees or parts of the trees. It will not be within the enclosure but may be an incorporated part of the fence. (If it is found that this deck could harm the grove the deck will be built on the path near the road with the same interpretative information).

Research: the grove will be available for research to any groups or individuals who may wish to use the area. Housing may be available at times to visiting researchers at CIMI.

Education: the grove is near a road and can be visited by any groups that have Catalina Conservancy approval (since the grove is on conservancy land).

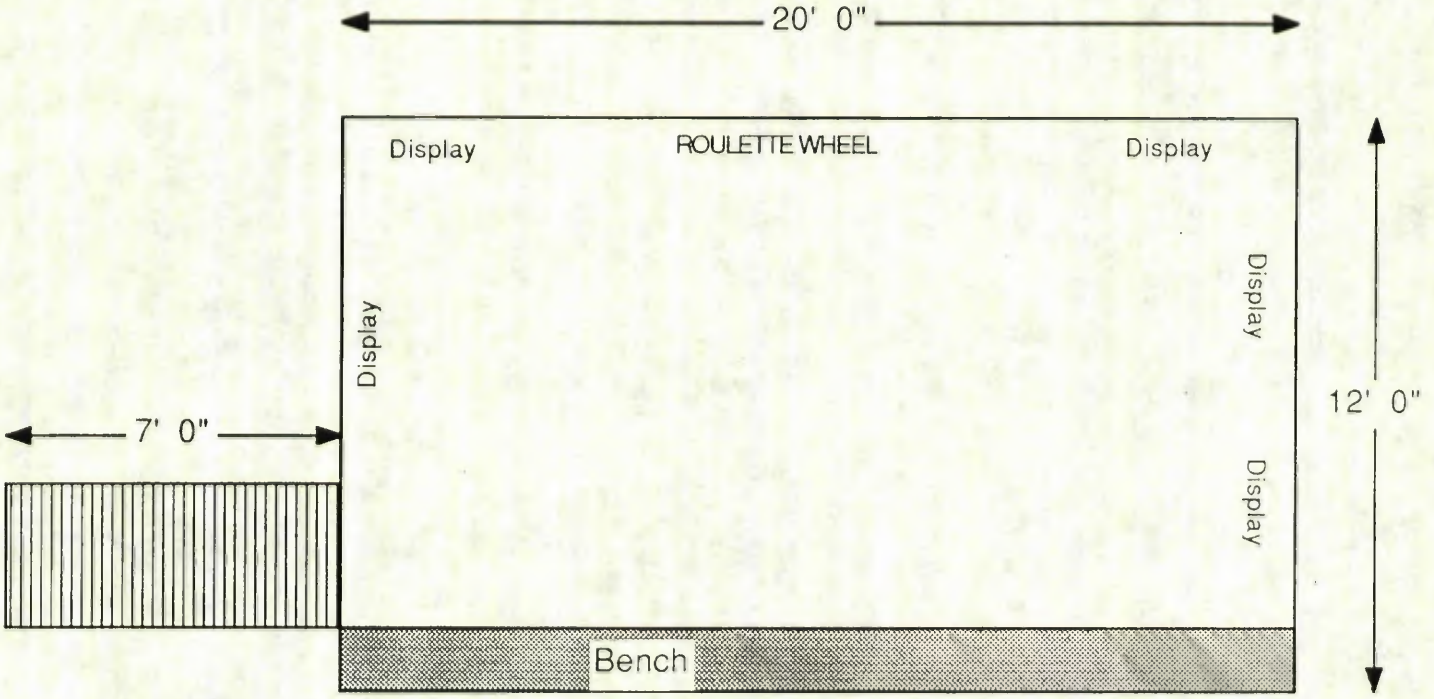
NOTES: We are trying to isolate this grove for protection of the trees from the grazing herbivores and for study. We also feel that education will be the best method of protecting trees on the island so we are building the interpretive area inside the grove where it will have the greatest teaching potential. We hope to make this interpretive area available to our students, researchers, visitors of the Santa Catalina Island Conservancy and any other interested people. In the future we would hope to improve trails to the grove and publish articles and study results from this grove. Our hope is that this grove will help to initiate many more Ironwood restoration projects and educational displays. The educational displays found within this grove will include a Roulette type wheel game to show students the chances of Ironwood survival, photos, ring growth samples (to determine age), and terrestrial artifacts for discussing island ecology.



IRONWOOD (Lyonothamnus floribundis floribundis) GROVE ENCLOSURE

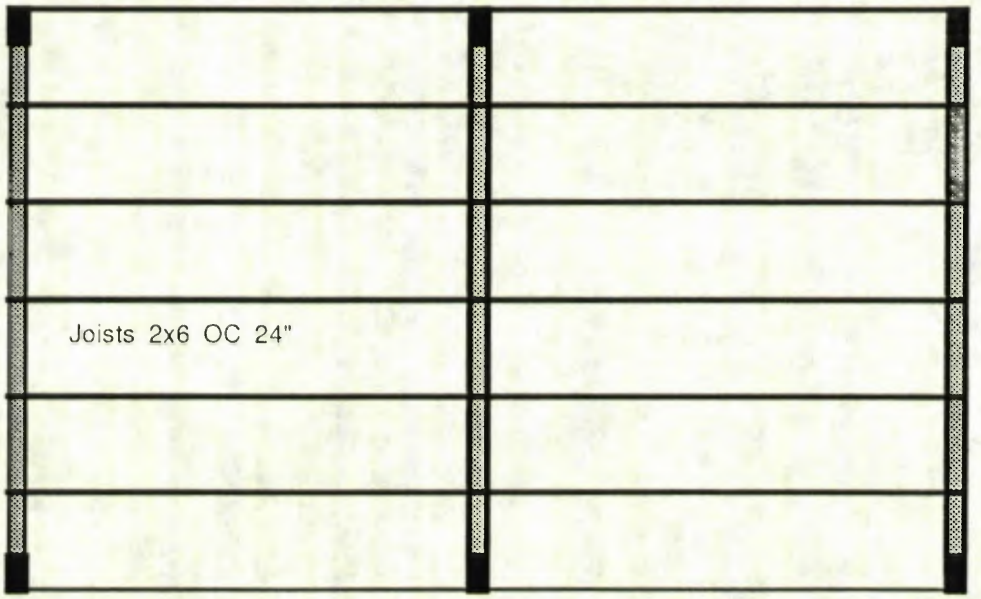
Fence will enclose approximently 22,000 square feet and about 200 trees. Approximently 12 trees will be left as control trees. A 250 square foot deck will be built to serve as an interpretive area with benches and displays. A new trail will be built that avoids the grove. The 600 + feet of fencing will be combination hog wire and barbed wire to a height of about 5 feet. There will be several access points for research purposes only.

IRONWOOD DECK



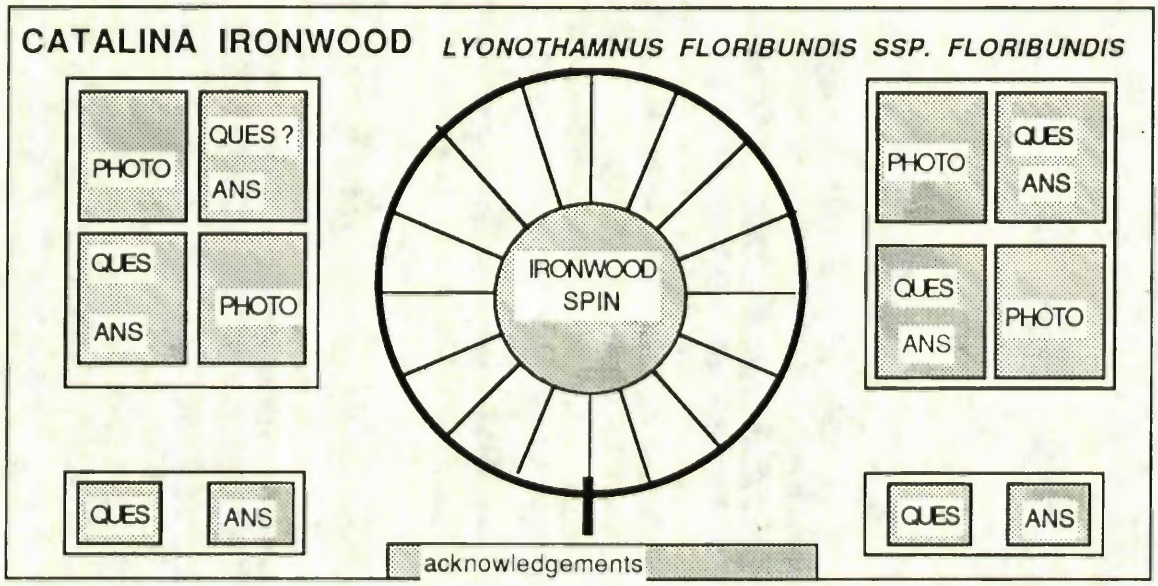
FRAMING DIAGRAM

Posts 4x6 (set 24"+ in concrete, diagonally braced) 6 total



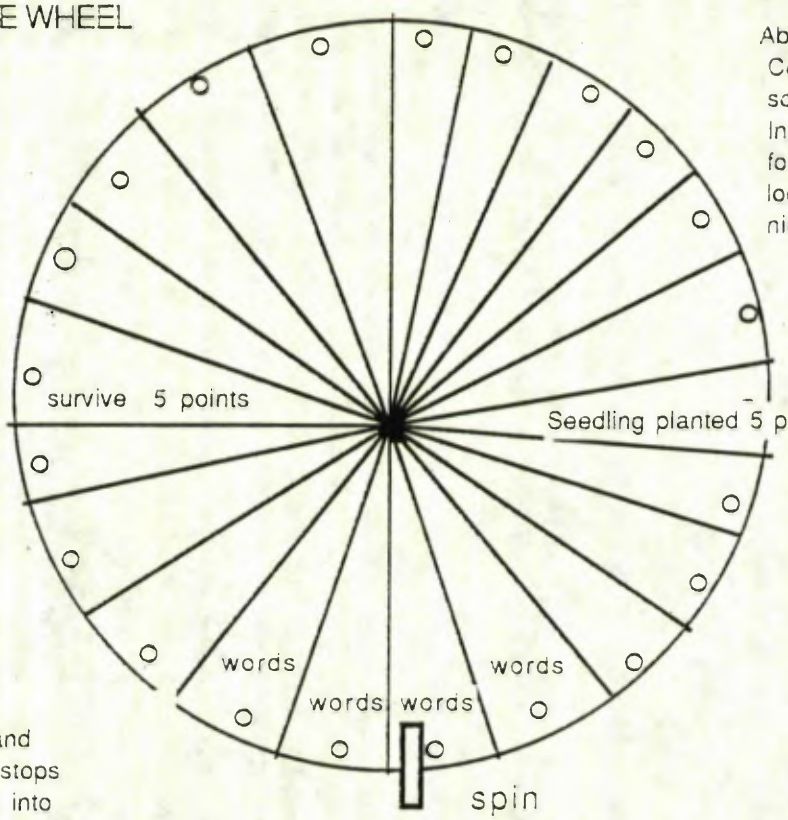
Girders attached to posts by Simpson post caps

Deck surrounded by 4'0" fence with hand rail



Background 4x8 MBO
3' Dia roulette wheel
Plexi or Lexan covering on wheel and display boards (removable)
All edges sealed
4"X4" Insert cards, laminated and removable

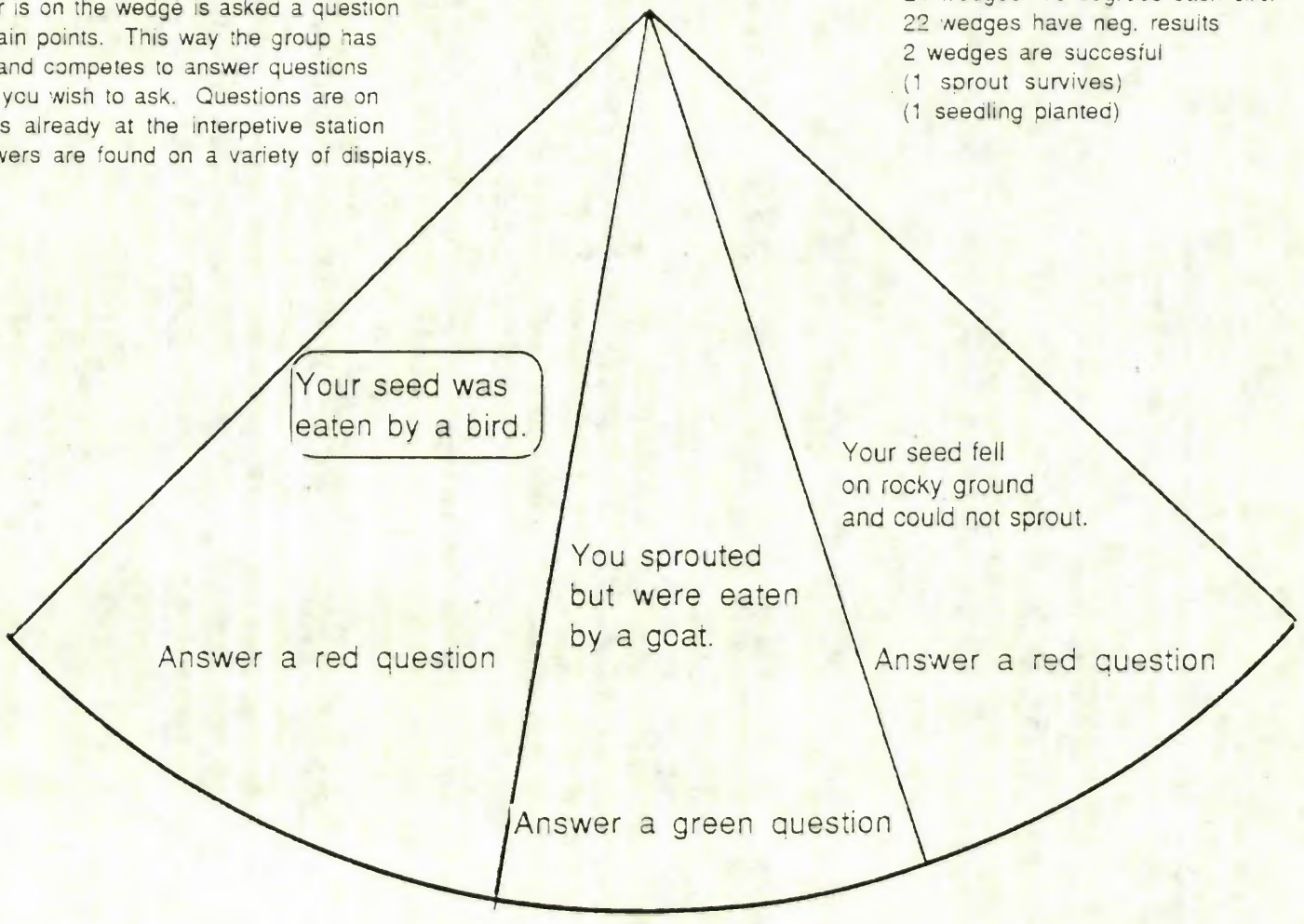
IRONWOOD ROULETTE WHEEL



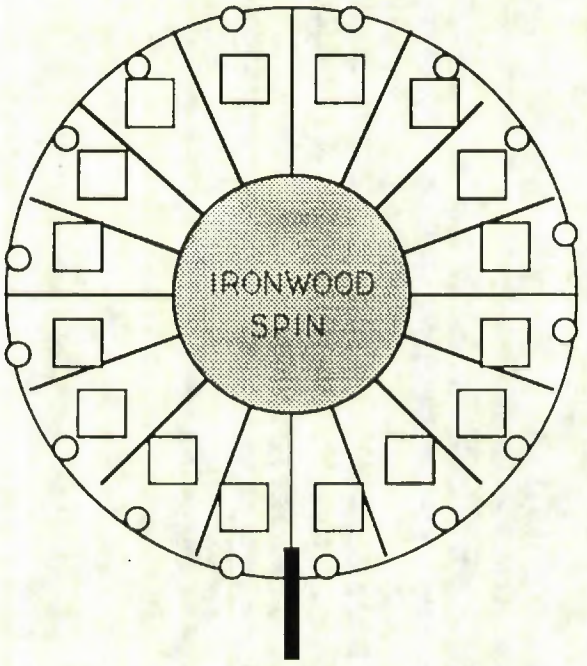
About 3 feet in diameter
Covered with plexiglass so as to be waterproof.
Inside labels are laminated for double protection and looks. Painted to look nice.

HOW IT WORKS...
The student spins the wheel and then reads the wedge that it stops on. Also the group is divided into two groups: red/green and whichever color is on the wedge is asked a question to gain points. This way the group has fun and competes to answer questions that you wish to ask. Questions are on cards already at the interpetive station answers are found on a variety of displays.

24 wedges 15 degrees each circ.
22 wedges have neg. results
2 wedges are succesful
(1 sprout survives)
(1 seedling planted)



CIRC. = 113.04"
EA. RAD = 7.06"
DIA. = 36"



YOU ARE A SEED
THAT WAS EATEN BY
A BABY PIG.

GREEN QUESTION

4"

4"