

REVEGETATION AT CRATER LAKE

NATIONAL PARK:

A PROGRESS REPORT

FOR 1979

Prepared By:

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INTRODUCTION

One of the most important goals in resource management of Crater Lake National Park's backcountry crew is to preserve the natural vegetation found therein and, where unduly impacted by unnatural causes, to take the necessary steps to restore these areas to their former conditions and prevent further denudation.

Since 1977 the backcountry crew at Crater Lake has initiated work on vegetative rehabilitation of impacted sites in the park. The reports completed to date have been largely in the form of recommendations for future work and the identification of sites where rehabilitation is necessary. Barnes' 1978 report also included a very complete compendium of research reports and other literature that is pertinent to Crater Lake's needs. While the accomplishments to date are small in proportion to the work which must be done, combined with other seasonal projects such as code-a-site, trail conditions, backcountry use and permanent camp establishment, etc., the important baseline information for a rehabilitation program is being completed.

As recommended by Barnes (1978), a comprehensive revegetation plan should be developed for Crater Lake National Park. An in-depth information gathering process was continued during the latter part of the 1979 season and concentrated primarily on two former construction-impacted areas and three priority backcountry sites. More work is required at each of these sites before actively rehabilitating them. However, the following are preliminary reports followed by recommendations on rehabilitation procedures.

IMPACTED SITE INVENTORY

In order to complete the preliminary condition reports, the following procedures were outlined for use. In the event that future study necessitates the gathering of more accurate and specific information, the procedures should be altered accordingly.

PROCEDURES

A. Mapping (In conjunction with code-a-site where possible)

1. Locate area on Topo
2. Locate approx. center of site and put north (N) arrow on gridded paper. Put in four cardinal plus four semi-cardinal arrows (N,S,E,W,NE,SE,SW,NW)
3. Use measuring tape to determine approx. distances along above line to edge bare ground (det. first what one square on gridded sheets will represent)
4. Sketch in features existing on and near site (as detailed as possible)
 - a. vegetation and types (genus and species)
 - b. stumps
 - c. rock outcrops
 - d. logs
 - e. streams
 - f. trails
 - g. structures, etc. (gullies, slope-aspect)
5. Complete map by connecting lines of bare edges, etc. Complete in ink. Place legend, scale, date, name in corner.
- C. If possible, record with photographs and photopoints.

B. Preliminary condition report

1. Attempt to determine cause and dates of damage.
2. Summarize site conditions considering veg. types, erosion, present use, etc.

C. Preliminary rehab. recommendations from on-site inventory

1. What has been done
2. Prevention of future damage
3. Erosion and drainage considerations
4. Soil fertility and soil compaction
5. Transplanting
- C. Record keeping (a folder on each site could be opened to document all activities) (see Barnes, 1978, Kirschner, et al, 1977, and all pertinent literature in rehabilitation collection)

PRELIMINARY CONDITION REPORTS*

A. Upper Dutton Septic Tank Drainfield

This area is located in the SW 1/4, SW 1/4 of section 5, Township 31 S, range SE. It lies only a few hundred yards across the road from Rim Village to the southwest. Because of its proximity to this heavily used area, this site was chosen shortly after June 1975 for septic tank drainfield establishment for all facilities west of the lodge found at Rim Village. The drainfield continues to be used today, but plans call for ceasing use in the near future.

When the septic tanks were installed it is evident that much vegetative destruction was caused through top soil removal and by the impact of motor vehicles. At present two long septic tanks are found on the site. They are made of wood and have several openings which could be serious safety hazards if children were to open or play around them. The drainfield is largely denuded and is located a very short distance above the spring of Dutton Creek. Although verbal reports from the park water specialist indicate no abnormal water quality problem in the creek, the potential is present. Dutton Creek is used as a primary water source by backcountry users and permanent backcountry campsites may be established close to it in the near future. Furthermore, the Dutton Creek trail passes through the western corner of the site where gullying and denudation are present. To the user this condition may be regarded as aesthetically displeasing. In addition, a pungent odor emanates from the tanks.

At present the size of the impacted site has been estimated at 2.5 acres. It is very likely that, because of its denuded condition and sloping contour, the site will slowly increase in size due to soil creep and erosion. The absence of large areas of vegetation presently encourages the depletion of topsoil, especially during times of high precipitation causing gullying. A system of gully channels has established itself in the northern part of the site carrying significant quantities of sediment to the western downslope area. This condition would be worse were it not for the presence of a small clump of hemlock trees found where the gullies meet.

The vegetation on the site consists primarily of mountain hemlock trees intermixed with plants including: woodrush, sedges, newberry knotweed, pussypans, dirty sox, lyall lupine and timberline phacelia. Only the woodrush is not found in the patches of vegetation of the clearings between the denser tree clumps indicating that combinations of those probably existed before the impact was made. Little forest litter or duff are found on the site save for under living trees and dead and decomposing stumps.

The soil on the site appears to be somewhat shallow to bedrock. Without litter accumulation and with the extent of erosion it is likely that soil nutrient losses are significant making difficult for vegetation to grow. Soil analyses should be carried to test fertility. Excavations conducted on the site have unnaturally piled soil in some areas and left others lacking, contributing to the gullying found. Downslope transport of soil could have devastating effect on the Dutton Spring.

* Refer to enclosed maps of sites.

Human structures include the two septic tanks which are over 40 meters in length and close to 1.5 meters in width, as well as one large concrete block found not more than 20 ft. from the Dutton Creek trail in the western corner of the site. Both are aesthetically displeasing and measures should be taken to 1) remove them, or 2) cover them and establish vegetation to hide their presence and/or make them safe.

Preliminary Recommendations

1. Remove and/or cover any structures present
2. Prevent further soil and vegetative loss by installing check dams or drain bars wherever needed.
3. Check soil conditions.
4. Prepare soil by adding fertilizer if needed, aerating it by turning over, and redistributing to area presently appearing empty and gullied.
5. Obtain and disseminate seeds of indicated plants first with small test plots and if successful over all the site. Consider the vegetation closest to plots in question as important input in the decision factor.. Transplants may be necessary and perhaps easier in some instances. (See Barnes, 1978, and Van Horn, 1977)
6. This site should be considered among the top priority sites to re-vegetate primarily because of its proximity to Dutton Creek and the rim area. The rate of further vegetation and soil loss will only accelerate with time.

SEPTIC TANKS

GRASSES, WOODY HERBS,
AND REEDS, MOUNTAINS, DIRT SOILS,
PANAS, LYALL LUPINE, TIMBERLINE PINE,
GULLYING AREAS

APPROXIMATE BORDER OF BATH
AREAS.

Rocks

+ APPROXIMATE CENTER OF AREA

ESTIMATED SIZE OF REMAINING SITE = 2.5 ACRES.

AVERAGE SLOPE = 5-10 %

ASPECT S TO SE

5

UPPER DUTTON CREEK SEPTIC TANK DRAIN FIELD AREA

MS

W

王

34025

SEVERELY
EROSIVE
AREA

DOWNED LOGS
GRUNDS

17790 1000000

4-11-19

20

卷之四

SIGN
OLD BUTT
CREEK
TRAIL

VEGETATED - 90%
BROWN - 10%

Score

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 84

B. Fire Roads and Trails Throughout the Park

Almost all backcountry fire roads are presently being used as a trail system for the park. These roads however do not comply with accepted trail standards primarily because of their double tread character. In some instances trails have been rerouted causing confusion for users who become used to following a fire road for a trail. In other instances, too, fire roads are found to be partially paved. And, in still others, trails either double-tread or single are poorly routed and constructed, causing vegetative denudation. As Hoskins (1979) mentions in his "Backcountry Trails Report" these problems need attention if Crater Lake is to standardize and improve trail conditions. Most activities for trail improvement in the park fall in the category of rehabilitation.

A list of priority sites would include:

1. Confusing spur at PCT - Pumice Flat junction
2. PCT junction with the fire road to White Horse Bluffs
3. Areas along and close to the Discovery Point Trail
4. Trailhead areas such as Lightning Springs
5. Old road toward Watchman Peak
6. Make a single tread of all highly used backcountry trails beginning with the PCT and rim access trails and proceeding with less used trails.
7. Trail from the PCT to Mazama Campground is presently in very poor condition. Because it appears to follow a natural drainage, gullying and soil loss is occurring.

Preliminary Recommendations

1. For those fire roads presently being used much by backcountry hikers, debris should be scattered on one track to begin its obliteration. Where trees have begun to return, these should be allowed to remain and if possible encouraged through thinning and planting. The YCC group almost completed an exemplary trail to Crater Peak and beyond.
2. Confusing spurs should be revegetated for the first 100 yards, at least to remove all indication of presence.
3. Where erosion is occurring, trails must be rerouted to follow contours and proper water bars installed to prevent further losses.
4. Unsightly trailheads need to be inventoried like any denuded site, through the procedures presented in the foregoing, and determinations made on what steps must be taken for their rehabilitation.

C. Lightning Spring Backcountry Camp Area

This site is located in the SW $\frac{1}{4}$, NW $\frac{1}{4}$ of Sec. 25, T 30S, R 5E and is found approximately .8 miles from Rim Drive. As it appears now, Lightning Spring Camp is perhaps one of the most accessible overnight backcountry camps in the park. As such it has for some time received much use and, as a result, it has suffered from human impact. Nevertheless, the area will continue to be used and measures have already been initiated to accomodate further use without further destruction.

Thus far 3 backcountry campsites have been established away from the most impacted area (close to the stream) and the trail has been rerouted leading users to the camps.

The area presented impacted begins at the PCT and continues down toward the new backcountry sites. About 200 meters from the PCT there is a large area where much camping once took place and where a pump-house once stood. This is the site where the greatest denudation has occurred. It is open but now lacks any natural cover such as woodrush and sedge. Furthermore, it lies only a few feet from Lightning Spring.

The present soil conditions of the site appear to be the limiting factor for revegetation. Soil compaction is extensive preventing seeds from germinating properly or grasses from sending out root systems. Some erosion has begun to occur close to the PCT junction and a small gully has been forming.

Preliminary Recommendations

Already some work has been initiated to rehabilitate the site. It includes: 1) rerouting trail, 2) construction of backcountry sites, 3) closing of lower rehab. area with debris and "reseeding" signs, and 4) tilling of the most impacted area where the pumphouse once was.

Further rehabilitation procedures for the following summers should include: 1) totally closing off the old trail to camp area and further rerouting trail to camps (as shown on map), 2) tilling all that trail completely after observing revegetation effects from 1979 tilling project, 3) conducting a simple soil nutrient analysis to determine need for fertilizer, 4) careful monitoring of tilled sites noting rehabilitation.



SIGN TO BACKCOUNTRY CAMPS

PCT

SIGN POST ON WATER

RIDGE

RIDGE

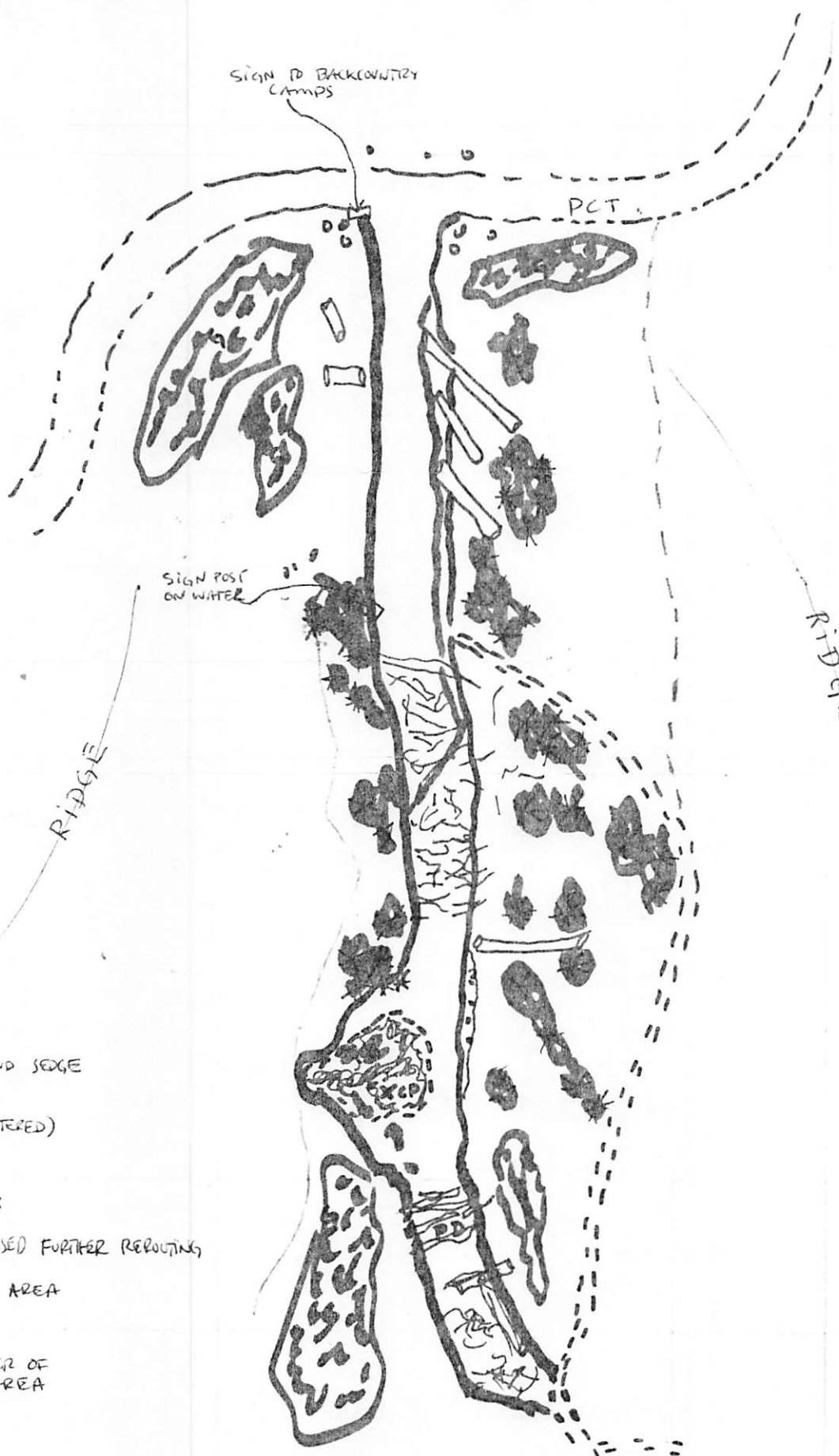
LEGEND

- GRASSES: WOODRUSH AND SEDGE
- GULLY
- FOREST DEBRIS (SCATTERED)
- PUMPHOUSE DEBRIS
- LOGS
- MOUNTAIN HEMLOCKS
- TRAIL
- PROPOSED FURTHER REROUTING
- 1979 SOIL TILLING AREA
- KCP CENTER POINT
- APPROXIMATE BORDER OF REHABILITATION AREA
- SLOPE: APPROX. 10%
- ASPECT: S TO SW

SCALE 1" = 10 m

LIGHTNING STRIKES BACKCOUNTRY CAMP AREA

TO BACKCOUNTRY CAMPS



D. Dutton Creek Area

This rehabilitation area is found in the SE $\frac{1}{4}$, NE $\frac{1}{4}$ of Sec 12, T 31S, R 5E, between Dutton Creek and the upper fork of Castle Creek and together comprises approximately $\frac{1}{2}$ acre. Probably the most used backcountry camping area, Dutton Creek contains two sites in need of vegetative rehabilitation (see Hoskins, 1979). Both lie in plain view of the PCT and social trails have developed to Castle Creek. This is perhaps why continued use of the areas persists even though they are clearly in violation of regulations. Backcountry camps should be established in order to discourage further impact. The aesthetic values of that portion of the PCT would otherwise deteriorate still more.

Vegetative conditions of the sites are not critical yet, but if not relieved of impact total denudation is forthcoming. At present mountain hemlock and lodgepole pines dominate the site together with red stemmed grama, lupine and currant. Particularly close to the fire rings shown on the map, these species have disappeared. They are scattered but present as one leaves the immediate vicinity of the rings. Soil conditions appear favorable and not yet overly compacted to prevent natural revegetation if the areas are closed off.

Preliminary Recommendations

The two Dutton Creek sites do not appear to need much active rehabilitation save protection from further impact and encroachment combined perhaps with some seedbed preparation accomplished by tilling in the most compacted locations. Procedures for rehabilitation should include:

1. Proper signing for discouraging use of sites
2. Construction of established backcountry sites
3. Preparing soil for natural regrowth by tilling followed by careful monitoring (using code-a-site if possible).

Failure of natural revegetation should prompt action for transplanting or seed dissemination.

E. Red Cone Springs Area

Red Cone Spring is located 3.7 miles west of the North Road on the PCT. It too is a popular camping area mostly for its location as the first water source in the park along the PCT coming from the north. The primary rehab. site lies at the end of the access trail to the spring. It has been impacted with tents and trampling as well as constant fire ring relocation.

The vegetative cover consists of several scattered hemlock and lodgepole trees as well as lupine, eriogonum and dirty sox. The latter could be easily reintroduced if the area was protected from impact. The soil too could be turned, aerated and seeded if needed.

Preliminary Recommendations

The Red Cone Spring area will always be a difficult one to work with because of the aesthetic attractiveness of the spring and of the surrounding vegetation. The construction of established campsites could relieve current camping pressure close to the spring, but without an established trail with thicker vegetation on its perimeter visitors will continue to trample the entire extent of the presently impacted site. Furthermore, the site may need to be studied further for soil conditions in the event that, after protection, the area does not revegetate naturally.

RED CONE SPRING AREA

REG

SCALE 1" = 30 M

- AND MOSS
- EDGEMAN, DIRT, SOT
- TALL GRASS, LUPINE
- WOODS AND TREES
- OLD JUNK METAL
- SUMPS
- PIPE FEEDING FROM SPR.
- TREES: RED, LODGE
- AND SOME HER
- APPROX. LIM. 300 REHAB. AREAS

LEGEND



RED CONE SPR. ACCESS TRAIL

Rocky Ridge

CONCLUSION

Time constraints have impeded the progress of the park's rehabilitation program. However, the resource management division is beginning now to become concerned for its progress and although much more ground work is needed before active rehabilitation is initiated in the most impacted sites, a solid base of information is forming giving managers a more accurate view on the magnitude of the project.

Again it should be stressed that after accurate inventory of affected backcountry and frontcountry sites, a comprehensive rehabilitation plan should be written. A tentative outline for a plan follows this conclusion, but it is not complete and should be revised continually. The reports pertinent to this one written in past years and during 1979 should be taken into consideration.

TENTATIVE OUTLINE
FOR A COMPREHENSIVE REVEGETATION PLAN FOR
CRATER LAKE NATIONAL PARK

| | |
|---|--|
| Notes |)Introduction
Justification
Management Responsibilities
NPS Policy
Crater Lake General Management Plan |
| See Kirschner
et al |)Description of the Park (vegetation, geologic make-up,
fragility of zones, etc.)

)Objectives of the plan
Detail which areas need revegetation/existing
vegetative damage
Inventory/Monitor areas
Recommendations for rehabilitation/prevention of
further damage
Implementations
Follow-up monitoring |
| Consult Shelby,
Wolf report,
CLNP plan, etc. |)History of Visitor Use Trends at Crater Lake
Areas of major use
Backcountry
Frontcountry

)Vegetatively Damaged Areas
Known areas
Frontcountry
Backcountry
Procedures for inventorying and monitoring areas
mapping - detail inventory (veg., topo., aspect)
history of management of area (how became denuded),
causes of damage |
| Use Code-a-Site
where possible.

Folder for each
area should be
established

Safety
Erosion
Fragility
Length of time
denuded
People |)Recommendations for Rehabilitation and Prevention (Pro-
tection) of Further Damage
Determination of most critical areas (Decrim process)

)Implementation Considerations |
| Park Division
Involvement
Tools, Etc. | |
| Record Keeping
Reports of Activities
on each site | |