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Richard Wilson, Director
California Department of Forestry
P.O. Box 944246
Sacramento, CA 94244-2460

Dear Mr. Wilson:

Dharma Cloud Foundation has a project to explore alternative futures for Jackson State Forest. As part of this project, I have been reviewing the history of inventory figures for Jackson Demonstration State Forest (JDSF). This review raises serious questions about the inventory “growth” that you have cited in a number of recent articles. I’m sure that you would not want to be citing numbers that are incorrect. The purpose of this letter is to provide you with the information needed to correct your growth estimates.

The inventory numbers that you have cited appear to be based on the following:

- 1) The purchase resolution for the Forest made in 1947 states that the estimated inventory of timber was 585 million board feet (MMBF).¹
- 2) A recent inventory estimate being cited by you and your staff is 2,200 MMBF.²
- 3) These two figures together imply that the inventory of timber in the Forest has approximately quadrupled under the stewardship of the California Department of Forestry (CDF).

This is a impressive increase in inventory, and it is not surprising that you are using it as evidence of the effectiveness of CDF’s management of the Forest.

In the Advocate News on October 23, 1997, you stated, “More impressive [than the profits], however, is the fact that the volume of growing timber has quadrupled during the same time [1947 to 1997] due to the concerted practice of sustainable forestry by JDSF.”

In the Santa Rosa Press Democrat on November 23, 1997, you stated, “Consider that in the past 50 years, even as growing stocks have more than tripled, timber management activities have generated more the \$160 million in public revenues.” [emphasis added.]

Given the importance you are attaching to the measured growth in inventory, I urge you to examine the historical numbers carefully. When you do so, you will find that you are drawing an erroneous conclusion by comparing incomplete, incompatible, and very likely, erroneous numbers.

Chart 1 shows the progress of inventories over time, from the time of acquisition in 1947 through 1996. These data were obtained from various Management Plans of JDSF. More recent data were by private communication from JDSF personnel.³

All of the reported increase in inventories occurred at two points in time when the method of determining inventories changed. Note that the inventory figures were essentially constant between 1947 and 1955 and between 1960 and 1984. The entire reported increase occurred in just two periods, from 1955 to 1960 (802 MMBF) and 1984 to 1996 (1098 MMBF).

The first systematic inventory of Jackson State Forest was made in 1958-60, when the Continuous Forest Inventory (CFI) system was established. Prior to that time, estimates were based on old and incomplete data. For example, old growth volume estimates for 1955 contained in the 1958 Jackson State Forest Management Plan were derived from the Mason-Stevens cruise of 1929, adjusted for cutting experience by Caspar Lumber Company and the State.⁴ With respect to volumes of young trees, the 1958 Plan stated, "Data concerning volume on previously cut lands ... is not adequate and will require strengthening as time goes on in order to prepare for management of young growth areas."⁵

The first CFI inventory caused a remarkable jump in estimated inventories – from 604 million board feet in 1955 to 1406 million board feet in 1960. Although, the Management Plan of 1964, which reported the new inventory numbers, does not comment on the sources of the increase, Table 1 shows that essentially all of the increase in the 1958-60 estimate versus the 1955 estimate came from a very much higher estimate of Young Growth (977 *versus* 254 million board feet). Almost certainly, the explanation for the huge increase is that previous inventories paid little attention to "unmarketable" second growth. The matter warrants further investigation, which I urge you to conduct, but I feel safe saying that little of the estimated increase reflected actual physical growth within the forest.

The second large increase in estimated inventory occurred between 1984 and 1996. The CFI inventory system was replaced by an new system in 1988-90. The 1990 inventory estimate was 540 million board feet greater than the 1984 inventory. The 1996 inventory figure is based on computer extrapolations of the 1990 inventory. The 1996 inventory shows a further increase of 558 million board feet. Of course, growth of this magnitude in ten years is impossible. One explanation is that the CFI system was seriously underestimating inventory and growth, and the new system corrected these errors. However, as I have documented in a letter to Marc Jameson, a copy of which is enclosed, there is compelling evidence that the CFI was accurate and the new system is seriously overestimating the inventory.

The increase in reported inventory is the result of the introduction of new inventory systems rather than any growth in inventory. The new systems used different parameters than the former ones, and the most recent system appears to contain significant errors.

The CFI inventory was in place for 25 years, from 1959 through 1984. During this period, inventories remained essentially constant (and in fact declined rather steadily during the last 20 years of the period). This is strong evidence that there has not been any significant growth in inventory in Jackson Forest during the time of state ownership.⁶

That inventories have remained constant in Jackson Forest is not surprising, because it has been the long-standing policy of management to cut all incremental growth in the Forest.⁷ When all growth is cut, there will be no growth in inventory.

I urge you to correct the record with respect to the behavior of inventory in Jackson State Forest over time. The correct statement is, "The volume of growing timber in Jackson Demonstration State Forest has remained constant between 1947 and 1997 due to the management policy of cutting all incremental growth in the Forest."

I look forward to your response.

Sincerely,

Vince Taylor

Enclosure: Letter to Marc Jameson, dated April 22, 1998

cc: Marc Jameson, Dana Cole

¹ Resolution of the State Forest Purchase Committee, adopted 1/9/47.

² Based on data supplied by Norm Henry and Marc Jameson in a private meeting, 10/28/97. The 1996 estimate is based primarily upon the 1990 inventory, with some sample adjustments made in 1997. The 1990 inventory was then "grown" via a computer model (FREIGHTS, which is a variation of KRYPTOS) to yield the 1996 estimate. The figure given by Henry and Jameson for 1996 was 2.2 billion board feet for 48,500 acres.

³ Detailed source information is contained in the notes accompanying Table 1 attached to this letter..

⁴ Management Plan for Jackson State Forest, April, 1958, p. 5.

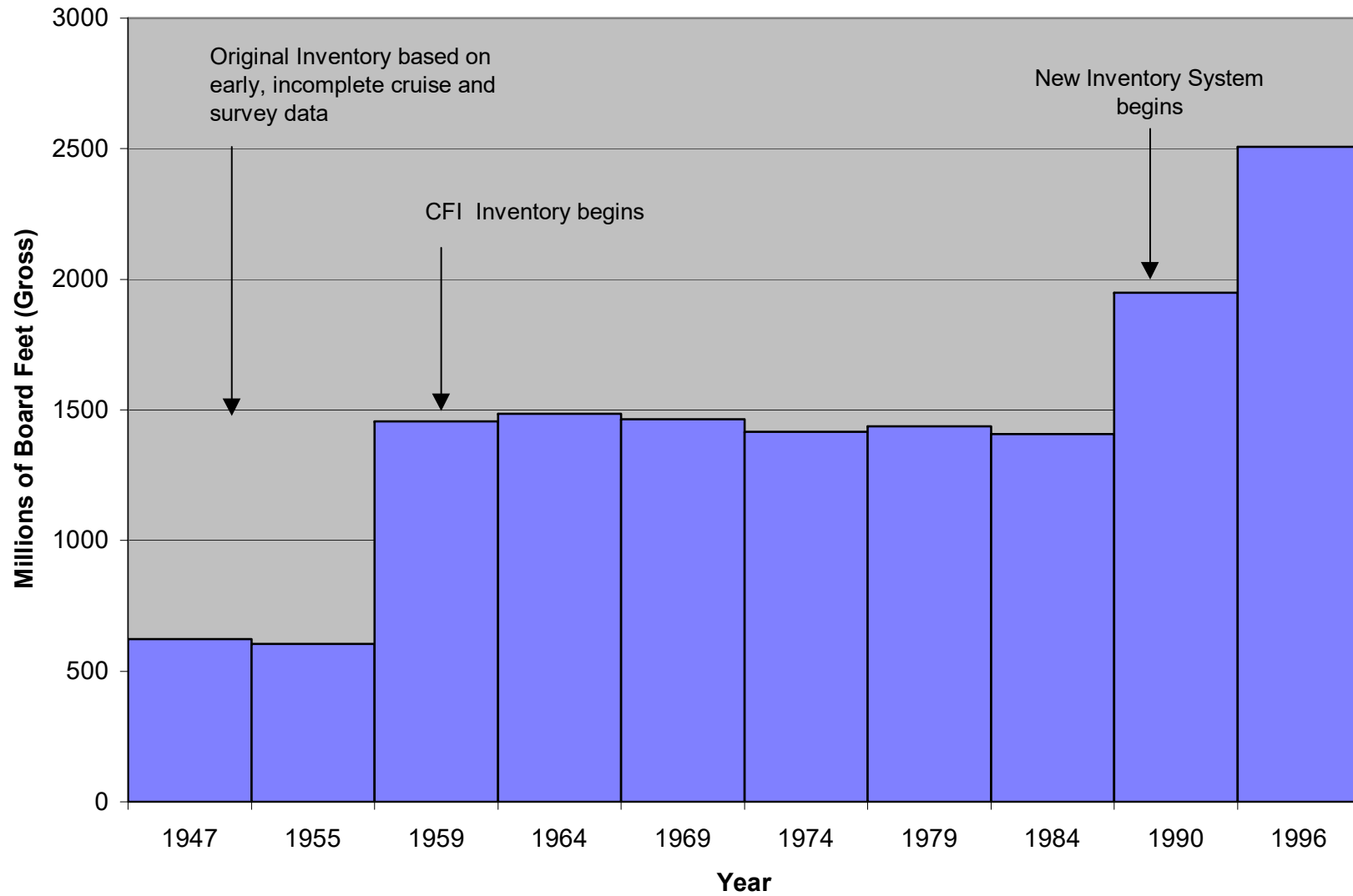
⁵ IBID, p. 5. In part, the lack of good data on young growth reflected the lack of immediate need, because the managers of the forest were planning to cut only old growth during the period covered by the management plan (not a precise period, but apparently between five and ten years.)

⁶ In fact, the CFI inventory data suggest that inventories may have declined under state management, at least since 1964. In 1964 the Forest inventory was estimated to be 1486 million board feet. In the last year in which CFI estimates were made, 1984, the estimated inventory was 1408. Thus, over this twenty-year period, the inventory declined by 78 million board feet, implying that the harvest averaged 4 million board feet more per year than timber growth. See Table 1. Unfortunately, the CFI estimates have not been continued, so we don't know if this downward trend continued.

⁷ The first available Management Plan (1958) states, "The cutting budget is made up to approximate the annual increment on the Forest ...," p.16. All later plans state similar goals.

Chart 1

Jackson State Forest Timber Inventories



**Table 1: Estimates of Timber Inventory in Jackson State Forest
(Millions of Board Feet, Gross Volume¹)**

Year	Old Growth	Young Growth	Other ²	Total
1947 ³	236	349		585
1955 ⁴	350 ⁵	254 ⁶		604
1958-60 ⁷	355	977	74	1406
1964 ⁸	282	1114	91	1486
1969 ⁹	269	1126	69	1464
1974 ¹⁰	221	1134	62	1417
1979 ¹¹	138	1234	66	1438
1984 ¹²	102	1247	59	1408
1990 ¹³	na	na	na	1948
1996 ¹⁴	na	na	na	2506

na = not available

¹ To make the estimates in different years as comparable as possible, gross volume figures were used for 1958 and later years. Earlier estimates were not identified as gross or net, but my working assumption is that they were gross volume figures. Gross Volume figures for 1958 and later years are before adding culls and dead trees into the inventory figures.

² "Other" consists of minor conifers and hardwoods, which were probably not counted in earlier estimates.

³ Resolution of the State Forest Purchase Committee, adopted 1/9/47.

⁴ Management Plan for Jackson State Forest, April, 1958.

⁵ The increase in estimated old growth between 1947 and 1955 seems to reflect a change in categorization, rather than any real change in estimated inventory. The 1955 estimate includes in the "Old Growth" category, old growth in partially and previously cut stands (a total of 103 million board feet). It seems likely that these latter categories were included in "Young Growth" in the 1947 estimate, because the amount estimated for 1955 in "Virgin Old Growth" stands was 237 million board, virtually identical to the 1947 estimate for "Old Growth" of 236 million board feet.

⁶ The decrease in estimated young growth was not due to harvesting, as no young growth was being cut. It seems likely that the earlier estimate for young growth included old growth in previously cut (young growth) stands. See the above endnote.

⁷ As reported in the 1964 Jackson State Forest Management Plan, Final Rough Draft, August 1964. These numbers were subjected to minor revisions in tables presented in later Plans. Note that these and all figures reported in later

Management Plans are derived from per acre estimates multiplied by 50,000 acres, an approximation of the acreage in Jackson State Forest.

⁸ As reported in the 1970 Jackson State Forest Management Plan.

⁹ As reported in the 1974 Jackson State Forest Management Plan.

¹⁰ Penned in entries for 1979 in the copy of the 1974 Management Plan obtained from the offices of Jackson State Forest in 1995, supplied by John Griffen.

¹¹ Derived from the 1983 Jackson Demonstration State Forest Management Plan.

This Plan presents only Net inventory data. The Net figures were translated to estimated Gross inventory by multiplying by the ratio of Gross/Net in 1969 for each species class. This method should give a very close approximation to actual Gross Inventory. In 1969, one species termed "White Fir" in the 1979 numbers was replaced by a "Grand Fir" species in 1969. I assume that these represent the same trees, since the numbers are comparable in the two years.

¹² Personal communication from Norm Henry, JDSF, December 9, 1997

¹³ "The New Inventory, What It Tells Us So Far," internal JDSF memorandum, prepared by John Griffen in 1993, based on analysis of data collected in 1989-90. Only the total inventory for the forest was supplied.

The 1990 estimate is first one under the new inventory system. The data were collected in 1989-90. The new system is based on a sophisticated "stratified sample" design. The forest was divided into a number of types of woodland, and the number and placement of data-sample plots were developed statistically to provide good confidence in the estimates for each type of woodland. The plots were sampled in 1989-90. New height/diameter/volume relations were also developed. A computer program was developed that translated the data measurements into estimated inventory per acre for each woodland type. Total inventory for the forest is obtained by multiplying the estimated acreage of each data type by the per acre inventory estimates.

The estimate supplied by Mr. Griffin was for 48,500 acres, the estimated acreage available for logging. To make the figures comparable to the previous ones, I have adjusted them to a nominal 50,000-acre forest.

¹⁴ Based on data supplied by Norm Henry and Marc Jameson in a private meeting, 10/28/97. The 1996 estimate is based primarily upon the 1990 inventory, with some sample adjustments made in 1997. The 1990 inventory was then "grown" via a computer model (FREIGHTS, which is a variation of KRYPTOS) to yield the 1996 estimate. The figure given by Henry and Jameson for 1996 was 2.2 billion board feet for 48,500 acres. I adjusted this to 50,000 acres for comparability. In the meeting, the 2.2 billion board feet number was compared to a 1.2 billion board feet estimate for 1984 under the old inventory system. The 1.2 billion board feet is *net* inventory on 48,750 (John Griffen, 1995). Using the 1984 ratio of gross to net inventory (1.105), yields an estimated gross inventory on 50,000 acres of 2506 million board feet.