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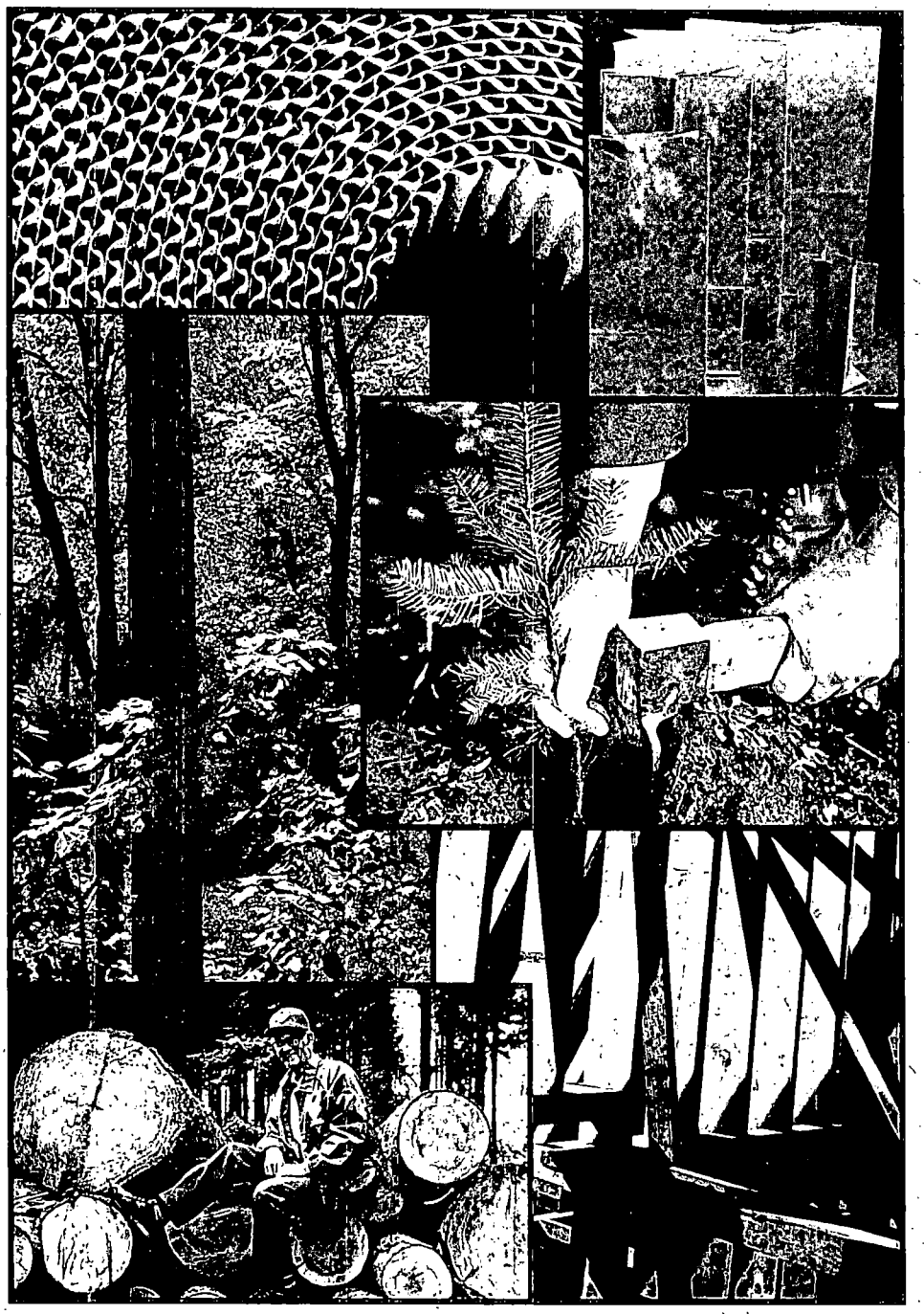

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Final Report on the Comparative Evaluation of Two Major Studies On the Employment Impacts of the ISC Northern Spotted Owl Conservation Strategy on Washington, Oregon, and California

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Introduction and Overview

This report describes and explains the findings of Regional Science Research Institute (RSRI) in its analysis of two major studies of the potential employment effects of the federal Interagency Scientific Committee (ISC) Northern Spotted Owl Conservation Strategy on the timber-producing regions of the U.S. Northwest. The studies in question, whose findings appear to be in major conflict, are by USDA Forest Service/USDI Bureau of Land Management (May, 1990) [hereinafter the FS/BLM report] and by Douglas C. Olson (June, 1990) [hereinafter the OLSON report].

Certain parts of the OLSON report, which was prepared by him as an independent consultant for Mason, Bruce, and Girard, were also abstracted for that firm by John H. Beuter in a shorter report (November, 1990) [hereinafter the MB&G report]. Note that in what follows, the OLSON and MB&G reports will be referred to inter-changeably except where their results, or the presentation of those results, differ significantly.

This analysis was undertaken at the request, and with the sponsorship, of the American Forest Resource Alliance (AFRA). AFRA felt that a third-party review was necessary because the issues involved were too important to be left unresolved due to the gap between the two widely divergent sets of findings. In particular, FS/BLM (Table 5, Page 48) estimates that the timbering restrictions proposed to protect the owl's habitat will cost a total of about 25,400 lost jobs by the year 2000; the corresponding OLSON (Table 11, Page 29) estimate is about 147,200 jobs.

This large a difference is especially surprising, given that both studies appear to use roughly similar assumptions concerning direct employment per million board feet (MMBF) of harvest, at least in the timber, lumber, paper (TLP) and directly-related industries. Also, both rely on related versions of the IMPLAN regional input-output models, constructed and provided by the Forest Service, in their estimations of indirect and induced employment and earnings (multiplier) effects.

Such a wide divergence, quite naturally, calls into question the assumptions and methods, and hence the results, of both studies. The present analysis investigates the differences in the assumptions made in the two studies concerning: (1) the prospective reductions in the timber harvest; (2) the economic activities and employment likely to be directly affected by these reductions, in addition to the obvious losses in the TLP industries; and (3) the external responses of log and lumber imports and exports, stumpage prices, and related economic reactions that might tend either to mitigate or to aggravate the loss of jobs in the Pacific Northwest.

The present study also investigates the apparent differences between the two IMPLAN economic impact models used in the studies and the reasons why such differences might occur, even though both are based on the same "model system." In this regard, keep in mind that the total job losses, noted above, are made up of direct plus indirect and induced effects, the latter two being calculated by use of IMPLAN. In the ensuing discussion, therefore, "total" jobs will refer to direct jobs plus multiplier effects.

Note that, for simplicity, the present analysis is restricted to harvest reductions and their resulting employment effects. Because of the close relationships between employment, earnings, income, value added, taxes, and other economic variables, changes in employment can be readily

translated into other economic changes. Furthermore, jobs are of the most immediate interest and the easiest effects for the public to understand.

The first part of the discussion below focuses on the origins of the differences in direct job estimates between the two studies. Differences in multiplier effects will be explored later. Finally, RSRI will present its best estimate of total job losses, based on FS/BLM, OLSON, and several related studies as well as RSRI's own regional economic models.

Assumptions Concerning Reductions in Timber Harvest

There appear to be three major sets of assumptions concerning future timber harvests that help to explain some of the differences between the FS/BLM and MB&G results. These involve: (1) the baseline from which reductions are to be measured; (2) the extent to which harvest restrictions on public lands in owl habitat areas will be applied, as well, to private lands in the same areas; and (3) the extent to which other private owners may increase their harvests or other supply changes may occur to make up for some of the shortfall in supply.

A. The Baseline Question

There are two main alternative baselines used, variously, in the two studies. One reflects harvest restrictions that are already expected to occur due to the recent or pending plans of the Forest Service and/or the Bureau of Land Management for the 1991-2000 period. The alternative baseline is the 1983-87 average annual harvest. Although there are some minor differences between established and pending plans in the FS/BLM study, the important point is that the baseline "with plans" averages only about 86% of the annual average harvest for 1983-87, after summing across both public and private ownerships.

1. The Olson/MB&G "1983-87 Average" Baseline

The OLSON report notes that existing plans, even before the imposition of the ISC owl protection strategy, would already curtail harvests. In fact, the significance of these "pre-existing" harvest reduction plans is so well recognized that a note to Table 9, Page 27, in the OLSON report specifically states that the "...impact analysis will reflect Planned harvest before ISC study." This seems to imply that the reduced yields under Forest Service plans will be used as the baseline, but the impact analysis is actually carried out using the 1983-87 harvest average as a base.

Table 11, Page 29, of the OLSON report explicitly defines the 44,436 total jobs lost due to restrictions "Planned before ISC" as part of the 147,193 total jobs to be lost due to the ISC "Public and Private Restriction". In the MB&G adaptation of the OLSON results, however, these 44,436 jobs appear in Table 5, Page 25 while the 147,193 total appears in Table 7, Page 27 which is entitled, "Expected change from 1983-87 employment during 1991-2000 with ISC strategy implemented on both public and private lands." The less-than-careful reader might, from this, gain the impression that the entire 147,193 jobs would be lost solely due to the ISC strategy.

However, the MB&G report, in its text on pages 14 and 15 then goes to some pains to differentiate between harvest losses due to existing "forest plans" and those due to the ISC strategy. A possible source of confusion here is that the "additional loss...compared to that expected for the

projected harvest before the ISC strategy" is given as 73,150 jobs, whereas the correct figure, at least from the tables in both the OLSON and MB&G reports, is 102,757 total jobs (cf. MB&G, Table 8, Page 28). MB&G does give the latter figure in the first paragraph of Page v of the executive summary to its report.

As a further indication of the potential for confusion, Maki & Olson (1991, p.5) conclude that "...the ISC strategy restricted to public lands would generate a loss of 40 thousand total jobs" [on top of the "...44,436 jobs that would have been lost...without the ISC strategy...", op. cit., Page 4]. "Additional [their italics] job losses due to the application of spotted owl restrictions on private lands would total to 102 thousand over the 1991-2000 period." A reasonable person might conclude from this latter statement that the lost jobs would be 44 thousand (pre-strategy), 40 thousand (ISC on public lands) and 102 thousand (ISC on private lands) for an implied total of 186,000. Although this was doubtless not intended to be misleading, the fact is that 147,193, the original total developed by Olson himself, was not mentioned in the Maki & Olson paper.

These anomalies are noted here, not to be hypercritical but only to point out that the OLSON and MB&G reports, and the Maki & Olson follow-up report, present results in ways that are not always clear or consistent. Given the importance of these total employment impacts, especially to those whose livelihoods are likely to be affected but also to those who must make decisions concerning harvest restrictions, it is unfortunate that the results of the economic analysis, be they right or wrong, are not clearly and consistently stated.

2. The FS/BLM "With Plans" Baseline

Turning back to the original topic, the choice of baseline, recall that the purpose of the present report is to compare the FS/BLM and OLSON estimates of the regional economic effects of just the ISC owl protection strategy. FS/BLM provides two baselines, one based on harvests consistent with "current plans" and the other based on "actual or projected final plans." But it is clear from their Table 5, Page 48 that it is the less restrictive "current" plans baseline that is used in their employment impact calculations.

This is unfortunate for comparison purposes because OLSON apparently uses the "projected" plan figures in his pre-ISC scenarios; his "before ISC" harvests from FS and BLM lands totals 4368 MMBF (Table 9, Page 27), about the same as the FS/BLM "projected plans" harvest of 4406 (Page 42). However, as already noted, the OLSON analysis is carried out relative to the 1983-87 average harvest.

3. A Common Baseline

In any case, it appears that the baseline should be the 1991-2000 planned average annual harvest for those areas to be affected by the owl protection strategy before that strategy is imposed. This is the appropriate choice because it is most consistent with the charge to RSRI, is easy to adjust for in the comparisons being made, and is least apt to cause confusion. Most important, it would seem incorrect to attribute to the ISC strategy those harvest reductions that had been planned in the absence of that strategy.

In order to make this the common baseline, however, both the OLSON and FS/BLM harvest losses will have to be adjusted. In the OLSON case, none of the initial 1231 MMBF of lost harvest

is relevant because it is measured relative to the average for 1983-87; this gives a net loss for ISC restrictions on public lands only, relative to "projected plans", of 1798 MMBF (MB&G, Table 2, Page 22).

For FS/BLM, the harvest loss relative to "projected plans" would total 1781 MMBF (Page 21) rather than 2391: the latter, measured relative to "current plans", was originally used in calculating the direct FS/BLM job loss of 12,700. The remaining slight difference between the OLSON figure of 1798 and the FS/BLM figure of 1781 appears to be due to the fact that the Sacramento region is included in the former but not in the latter. Since all other significantly affected metropolitan areas are included in both studies, it seems sensible to adopt the OLSON figure.

B. Public and Private Harvests With and Without Restrictions

1. Restrictions on Federal Lands Only

As already noted, FS/BLM assumes that the ISC restrictions for the proposed owl conservation strategy will be applied to harvests from public, more specifically federal, lands only. As a corollary, FS/BLM projects that the higher stumpage and product prices, caused by the shortage of harvestable timber on federal lands, will encourage private and state government owners of forest land to increase their harvests (and Canadian producers to increase their exports to the U.S.) to make up part of the deficit. These projections are made using the Timber Assessment Market Model (TAMM).

In fact, FS/BLM (Page 47) projects that, by 1995, sufficient non-federal stumpage will come on the market to cut the total job losses due to the ISC strategy (federal lands only) by almost one half, from 25,409 to 13,272. However, it is also projected that these higher "private" yields will not be sustainable. FS/BLM calculates that, by the year 2000, the cutting of younger trees during the '90s will have reduced the annual harvest from private lands to the point that 2,756 additional jobs will be lost over and above the original 25,409, for a new total of 28,165.

2. Restrictions Extended to Private Lands

In evaluating these results, it is important to keep in mind that FS/BLM clearly assumed that the ISC restrictions would not be applied to non-federal forest lands. This was despite the fact that an earlier report by Rasmussen (1989) had noted that a substantial proportion of the total Northern Spotted Owl Habitat lies on private lands, especially in Northern California.

Furthermore, private owners were surveyed for the Rasmussen study, and many indicated how much the new guidelines, and especially the "50-11-40" rule, would restrict their harvests. In particular, the application of the "50-11-40" rule on 11" minimum diameter (breast height) of trees to be cut and the 40% "canopy closure" of the forest stand would apparently reduce harvest levels even in stands lying outside the designated Habitat Conservation Areas (HCAs).

Fortunately, RSRI's tasks for this report do not include an independent assessment of the projected harvest changes on either public or private lands. However, it is worth noting that at least Greber, Johnson & Lettman (August, 1990) [hereinafter GJ&L] make a careful and independent analysis of the potential harvest effects of various combinations of increased stumpage prices, ISC restrictions, and the application of the "50-11-40" rule to private lands in Oregon. The model used

here is called the Timber Resource Economic Estimation System (TREES) developed by Tedder, Schmidt & Gourley (1980).

From GJ&L (Table 16, Page 24) it is possible to get estimates of the upper and lower bounds on private harvest reductions under various scenarios, at least for Oregon. The extremes, for the year 2000, range from a total employment loss of 11,100 jobs if private owners respond fully to higher prices by increased cutting, to 36,200 jobs if private owners cooperate fully in conservation efforts, especially the preservation of HCAs. Once more, for consistency, these losses are measured relative to a baseline of current and proposed plans, rather than to the average of the 1983-87 harvests.

As with FS/BLM, the losses in 1995 are actually substantially lower than in 2000, reaching only 4,700 in 1995 under the "price response" scenario. But the larger private harvests cannot be sustained much beyond the year 2000 so even the "price response" job loss total rises to 17,600 by 2005.

3. Comparisons with the GJ&L Oregon Study

Although the GJ&L results apply only to Oregon, it is useful to compare them with the analagous job losses for that particular state in MB&G (Tables 5 & 7, Pages 25 & 27) or OLSON (Table 11, Page 29). OLSON estimates, in Oregon alone, a loss of 40,804 total jobs for the maximum conservation scenario relative to the "planned before ISC" projections.

This is not very much higher than the GJ&L estimate. However, the OLSON figure is for the "Owl Region" in Oregon whereas the GJ&L estimate is for Oregon as a whole. It is therefore more reasonable to calculate the Oregon portion of the employment effects for the total "3-state Owl Region" because this broader area captures more of the indirect and induced impacts, much as a full-state model does. Using the numbers in OLSON (Table 11, Page 29) gives an estimate of 51,600. This is probably too high, given that some "extra" impacts are captured by the 3-state region that would not be captured by Oregon alone. One could well scale this number back to, say, 50,000.

An even better comparison might be provided by adjusting the OLSON/MB&G figures for technological change. Using the data from MB&G (Table 7, Page 27) would lead to an adjustment from 50,000 to about 45,000. It is very likely that such technological change is incorporated into the Oregon "labor market model" used by GJ&L. Certainly, labor productivity increases are reflected in the long-term national forecasts from Wharton Econometric Forecasting Associates (WEFA) used to drive the Oregon model; they should be included, in any case, given past trends.

The 45,000 is still measurably more than the 36,000 maximum estimate of GJ&L. However, if some other reasonable adjustments (to be discussed below) were made to these particular OLSON estimates, the excess over the GJ&L figure would turn out to be relatively small. Therefore, one could conclude that, for Oregon at least, there is some independent support for the "maximum" OLSON scenario in which private and state lands all are affected, like FS/BLM lands, by ISC and other conservation restrictions.

At the other extreme, GJ&L's 4,700 total job loss for Oregon in 1995 with the "price response" scenario is actually measurably lower than the FS/BLM estimate of loss under its equivalent assumptions (no similar scenario was run by OLSON). If one assumes that Oregon would suffer a

bit over 50% of the job losses in this scenario, as it does in the conservation scenario (derived from MB&G, Table 5 or Rasmussen, Table 4, Page 24), then the FS/BLM total job loss of 13,000 for 1995 should translate into about 6,600 jobs lost in Oregon during the interim period when private owners try to fill the gap.

Although the difference between 6,600 and 4,700 is, in percentage terms, quite large, it is important to keep in mind that the results from the TREES and "labor market" models used by GJ&L and the TAMM and IMPLAN models used by FS/BLM may not be strictly comparable. And it is also not clear that the full-scale "price response" scenario is realistic or even relevant, given its lack of sustainability and the fact that at least some harvest restrictions are likely to be placed on private lands as well as public.

It does appear that, in the short-run at least, GJ&L projects greater price elasticity of private stumpage supply than does FS/BLM. However, the particular assumptions used would not be clear without a thorough analysis of the TAMM and TREES models, an effort that would go beyond the time and funds available for the present study. On the other hand, FS/BLM (Page 36) and GJ&L (Table 14, Page 23) do make identical assumptions about stumpage price levels in 1995 and 2000, both apparently adapting them from Hamilton et al. (1990).

In any case, the major task here is to determine why the total OLSON/MB&G job loss results are so much higher than those indicated by FS/BLM. Now, recall that the GJ&L "conservation" projections are fairly consistent, after some adjustments, with OLSON for the year 2000; and they are actually lower than the FS/BLM projections for the year 1995. This does not prove, of course, that an OLSON "private price response" scenario, if run, would also give a figure lower than that of FS/BLM; but it certainly does not prove the opposite, either.

4. Employment Effects of Extending Restrictions to Private Lands

In light of the foregoing, it appears that the direct employment effects of extending the ISC restrictions to private lands have been estimated quite well by OLSON. The GJ&L study, which is really the only source of even partially comparable job loss data, appears to give results that, under varying assumptions, seem to bracket OLSON's. Also, OLSON does a thorough job of estimating direct job losses per MMBF of harvest reduction (see his Appendix B); and his projected harvest losses for private lands are consistent with Rasmussen's.

Thus, there does not seem to be any reason to reject the OLSON estimates for the "other" (private plus state) portion of the direct ISC impact. Using the employment figures from MB&G Tables 5-7, one can determine that the direct losses for the 3-State Owl Region are 36,630 and 63,753 jobs for ISC restrictions on federal only and federal plus "other" lands, respectively. Since these losses are measured relative to the 1983-87 average, both must be reduced by 19,497, the jobs lost in the "with plans" scenario before the imposition of ISC. The result is 44, 256/17,133 = 2.58, the ration of federal plus "other" to federal losses alone.

The foregoing means that the direct job effects for federal lands, used by FS/BLM, will have to be increased by 158% to reflect the effects of restrictions on private and state lands as well and to make their figures comparable to OLSON's. This adjustment is not made quite yet, however. Even though a common baseline of harvest losses, 1798 MMBF, was established above, further adjustments must be made to the FS/BLM direct job losses before the 158% addition is applied.

C. Exports, Imports and Other Factors

The FS/BLM report discusses the effects of higher stumpage prices and other factors on imports, especially from Canada. At the same time, the FS/BLM scenarios include two alternative levels of restriction on exports, especially of unprocessed roundwood. One purpose of such restrictions, like the ones already in place, would be to maintain an adequate flow of logs to U.S. mills in order to mitigate some of the job losses that might otherwise occur.

1. The Effects of Imports from Canada

Since the import issue is less controversial, it is dealt with first. FS/BLM suggests that lumber imports from Canada will increase, not only because of the higher stumpage prices faced by mills in the U.S. Northwest, but also because the Canadians will be able to turn less of their softwood into newsprint for the U.S. market. One reason for the latter (cf. FS/BLM Pages 29-30) is that higher percentages of recycled paper have already been mandated for newsprint sold in the U.S. and that the "...Canadian industry would find it difficult to acquire enough wastepaper to meet the requirement." This, obviously, is due to the long distance between the western Canadian forests and the eastern metropolitan sources of recyclable paper.

At the same time, there will be some reduction in U.S. paper production that is based on byproducts of the lumber mills in the Pacific Northwest, as will be discussed below. Additional recycling could be utilized if paper prices rise sufficiently, due to both the U.S. harvest restrictions and the reduction in Canadian supplies, to make increased percentages of recycled paper economical . In any case, this could be an interesting example of a kind of "conservationist synergism" in which recycling could make it relatively less costly to save, not just the material being recycled and the resources that go into it, but also an "unrelated" endangered species.

FS/BLM states that the Canadian roundwood released from paper production for the U.S. would then become available for "...the solid wood segment of the Canadian industry. This may affect the outlook for the imports of softwood lumber from Canada." Thus, FS/BLM recognizes that the Canadian logs would be processed into lumber before export and that they would not be available to help keep Northwest U.S. lumber and wood products mills going in the face of the ISC restrictions.

The fact is, the Canadians place severe limitations on their export of logs, as noted by Sedjo, Wiseman, and Lyon (March, 1991) [hereinafter SW&L]. FS/BLM, using the TAMM model, projects a very substantial supply response in Canada to the increased stumpage prices in the U.S. It reports that Canadian lumber exports to the U.S. in 2000 will rise from 11,212 MMBF without the ISC conservation strategy to 13,693 MMBF with ISC, a 22% increase. Although this should not have any direct effect on the TLP industries of the Pacific Northwest, it could be important in mitigating the price rises of lumber, and hence housing and wood products, in the U.S. market as a whole.

It is not clear whether the results obtained by GJ&L from the TREES model or the employment effects obtained from the Oregon "labor market" model reflect any significant import response. However, it is very likely that imports (and exports) of logs and lumber are incorporated in the forecasts, supplied by WEFA, that drive the Oregon model. But even if imports are included, they will be overwhelmingly of lumber to replace U.S. production that would be lost anyway under the ISC restrictions. Therefore, such imports should not be expected to have any measurable direct

employment effects.

2. The Effects of Export Restrictions

The issue of exports is more controversial than that of imports, in part because there has already been government action on, and substantial public response to, export restrictions. Current federal law, enacted in the summer of 1990, reduces U.S. log exports by 450 MMBF from state lands in Oregon and Washington plus 150 MMBF from private "substitutes for federal logs". This is in addition to the previous restrictions imposed, during the years 1968-1974, on exports of logs from federal lands, which culminated in a complete prohibition of the latter. The additional restrictions are generally consistent with those used by FS/BLM (Page 40) in their "Logx1" Scenario.

SW&L argue that the export restrictions, given the predominant position of the U.S. in the Pacific Rim log market, have allowed the U.S. to extract monopoly profits from the logs it has exported. At the same time, they note that there is sufficient competition within the domestic log market to assure that when supplies are released from the export market, this will tend to reduce prices to lumber mills and other wood processors in the U.S.

SW&L then go on to argue that the new 1990 restrictions are non-optimal from the viewpoint of U.S. "monopoly profits." However, they do not conclude that the effects of the restrictions are necessarily bad for the domestic timber/lumber economy, though they may cause some redistribution of costs and benefits.

In particular, SW&L find that, under the pre-1990 restrictions, state and private exporters annually gain an additional $97 million in receipts, processors save $374 million in costs, and federal taxpayers lose $402 million in revenue. The 1990 legislation is estimated to cause the remaining exporters an additional $59 million gain in receipts, domestic purchasers an extra $463 million in savings, and federal and state governments an added revenue loss totaling $617 million.

Unfortunately, SW&L do not translate the cost savings to processors into added direct employment in the processing industries. Charbonneau and Hay (April, 1991) are also unable to give job estimates, although they do note (Page 14) that FS/BLM project, using the TAMM model, a stumpage price decrease of 2% by 2000 relative to what it would otherwise have been, due to the pre-1990 export ban on federal logs. On the basis of the SW&L figures above, the 1990 restrictions on state and private exports should probably cause at least an additional 2% decrease in stumpage prices for domestic buyers.

As discussed above, these prices are lower only relative to the higher prices that would be caused by the ISC harvest restrictions. Nevertheless, a mitigation of otherwise higher prices should be to the overall advantage of the domestic mills. Northwest Economic Associates (December, 1989) considers the problem that the "released" export logs may or may not be economical to transport to wood processors who have been negatively impacted by harvest restrictions in their locales. After careful analysis they conclude that either new mills will be built closer to the supplies of released logs or that the extra transportation costs will continue to reduce the profit margins of the more distant forests.

But in either case, they do not predict that the more distant timber will be left on the stump or that there will be any net reduction in direct TLP employment, at least for Washington. In fact, they

predict that losses in export and related employment will be more than made up for by additional processing employment, resulting in a net gain of 186 direct TLP jobs in Washington plus another 181 direct jobs in carrying out the capital improvements made possible by the roughly $50 million in increased net revenues of private growers and processors.

They do project, however, a net loss of 1311 direct jobs, caused by losses in school and municipal budgets that depend on timber trust and tax receipts. Thus they conclude that the loss of trust revenues due to the depression of stumpage prices on state lands would not nearly be compensated for by the increase of tax revenues caused by price rises for private stumpage.

As argued at some length, below, it should not be expected that a revenue shortfall would lead to completely commensurate expenditure and employment cuts. Nevertheless, it does seem reasonable to project that about two thirds of the estimated loss in public employment and public construction, or about 875 jobs, would take place. Balancing this against the 367 increase in private jobs would give a net loss of about 510 direct jobs for Washington.

It turns out that, by law, no logs are exported from state lands in Oregon. And exports of logs from any source in California are insignificant. Therefore, the regional total is a net loss of just 510 direct jobs due to the new export ban.

Since this loss is not taken into consideration in the baseline of either the FS/BLM or OLSON studies, it should be added to both. It is true that FS/BLM runs two alternative export ban scenarios, but the employment effects are neither reported nor included in the total of 25,400 jobs. It seems reasonable to include the effects of the 1990 export ban despite the fact that the ban and the ISC strategy are, strictly speaking, separate issues. They are combined here because it is clear that such a ban is intended to be part of an overall program to mitigate some of the effects of the ISC strategy on the wood processing industry.

Although the net direct employment losses caused by the export ban in Washington are not projected to be large, there may be some serious local dislocations. Those places that gain from additional processing employment may not be the same as those that lose other types of export-associated employment. Furthermore, the processing mills that gain are are likely to be in communities that also gain, or at least do not lose, public construction and government employment.

3. Effects of the Designation of CHAs

An additional factor, which would tend to negate some of the potential positive effects of the export restrictions, is the designation of critical habitat areas (CHAs) for the Northern Spotted Owl. Such designation extends the restrictions proposed by the ISC for the HCAs to include surrounding areas and a broader application of the "50-11-40" rule.

The effect, according to Charbonneau & Hay (1991), would be an additional loss of 2491 total jobs in 1995, based on the FS/BLM employment response coefficients. However, since this additional effect was considered by neither OLSON nor FS/BLM, it need not be taken into consideration in the comparison of the results of the two studies. Nevertheless, it would be important in any attempt to make a "best" estimate of job losses.

Differences between the OLSON and FS/BLM Impact Calculations

The foregoing has indicated some differences between the OLSON and FS/BLM studies with respect to projected harvests, price and import responses, export restrictions, and their interacting effects. Some of the other differences between the total job loss projections of the two studies appear to have been caused by differences in the effects to be included in the translation of harvest reductions into direct job losses. The rest seem to be due to variations in the "model adjustments", regional definitions, and methods of application employed in the two studies, given that the same basic IMPLAN model was used for both. In particular, the indirect and induced multiplier effects do vary somewhat between the studies.

A. Direct Employment Effects

There are substantial differences between the two studies in their assumptions concerning direct employment effects per MMBF of harvest. The most obvious difference is in the "base" employment effects: OLSON (Table 5d, Page 12) gives 6.1 direct jobs per MMBF (exclusive of the "residue-dependent industries which are considered separately, below); the corresponding effect in FS/BLM can be imputed to be 5.3 (Pages 42 & 46, keeping in mind that the latter table is in total [direct x 2] rather than in direct jobs).

It seems reasonable to use a common base as well as a common baseline. For this purpose, the OLSON direct effect of 6.1 jobs per MMBF is adopted because it is so well documented; FS/BLM says virtu-ally nothing about the sources for its 5.3 figure. Then, using the baseline harvest loss of 1798 MMBF (Section A,3 above) relative to "projected plans" gives a resulting loss of 10,970 direct jobs. This is a reduction of 1730 from the original FS/BLM figure of 12,700.

There are discrepancies in some of the other direct effects, as well. These include potential job reductions : at FS/BLM in public timber management; in local government because of reductions in "in-lieu" state and local tax payments from federal timber sales; in road building where timbering is no longer allowed; and in the processing of mill residues, especially in the parts of the paper industry that use them in their production processes.

1. Public Timber Management

There are reasons to question the appropriateness of some of the ancillary "direct" effects that OLSON includes. The most important issue is that some of them are already included, at least in part, in the "indirect" effects built into the input-output technology matrix used by IMPLAN.

For example, private timber management is clearly included in SIC 800 (Forestry). When timber is being cut from federal lands, the value of the timber is not differentiated, in the IMPLAN model, by type of ownership. Therefore, the value of timber that becomes an input into sawmills and other processors contains, implicitly, some costs for timber management, whether private and public, as long as the standard national (BEA) input-output coefficients are being used.

At the same time, OLSON is correct insofar as administrative employment at the Forest Service is "Government" activity of a type not directly affected by changes in private activity. Therefore, to the extent that timber management on federal lands requires overhead employment and expenditures over and above what would be expected in private timber management, these

employees are probably not included in the IMPLAN model. In fact, FS/BLM (Page 47) finds it necessary to estimate them separately, outside the model, at about 1500 direct jobs. Although it is not completely clear, the discussion in FS/BLM certainly implies that neither those 1500 jobs, nor the indirect and induced jobs they would generate, are included in the original 25,400 total.

OLSON (Table 7, Page 14) provides a breakdown of federal timber management costs that, unfortunately, does not really clarify how much of these costs would be included in private management as well. But it is reasonable to assume that "Growth Activity" ($41 million) and "Timber Progam Management" ($40 million) are things that would be carried on by the management of private, as well as public, timber stands. These make up approximately 25% of the $325 million total costs for Forest Service Region 6 in 1990.

On the other hand, the costs of "Sales Activity" and "Sales Administration" are presumably higher per MMBF for the Forest Service than for private operators: many of the latter are lumber companies who own their own forest lands and therefore sell predominantly to themselves. Adding a bit for the sales activity of those private owners who do not process their own timber would mean that about 60% of the federal timber management costs and employment are not accounted for by the input-output model.

If we accept OLSON's calculation of 1.17 employees per MMBF, this would mean that the "additional" government employment would really be .6 x 1.17 = about .7 employees per MMBF. Now .7 x 2625 MMBF (the amount of harvest lost, according to FS/BLM, from federal lands) = 1840, which is not very different from the 1500 estimated by FS/BLM. Given that the latter organizations are probably in a better position than OLSON to estimate prospective job losses, it then seems appropriate to reduce the factor to .57 in order to obtain the same projected 1500 direct federal employee loss.

2. Payments in Lieu of Taxes

A somewhat different question arises with respect to the federal payments in lieu of taxes to state and local governments when federal timber is sold within their jurisdictions. It is typical, in input-output models, to assume that a change in government revenues does not necessarily lead to an equivalent change in public employment. The reason for this assumption, of course, is that government employment, in theory, responds to public needs; then revenues are "raised" from whatever sources legislators and the voters can agree on.

Obviously the foregoing is an oversimplification; currently, during the present recession, failure to collect sufficient revenue in many jurisdictions has been causing layoffs of government employees, even in the face of pressing public needs. However, the results of the public budget process is usually a compromise, with irreducible needs for education and public health and safety being met, if necessary, by increases in taxes.

In any case, one would not expect a dollar-for-dollar decrease in public expenditures or a corresponding "one-for-one" employment decline for any given reduction in federal payments. One could argue that a "50-50" compromise might be typical, with half the loss being made up by employment cuts, and half by higher taxes. However, the potential decline in the tax base, especially in those localities that will be expecially hard hit by the harvest reductions under the ISC guidelines, may make a 50-50 split impossible. And population declines, as lumber workers seek

jobs elsewhere, may reduce some types of public expenditure needs.

As with the revenue losses from the state lands under the export ban, it seems more likely that two thirds of the loss will be made up by employment cuts, and one third by higher tax rates or other revenue sources. These impacts could end up being smaller, of course, if substantial federal compensatory subsidies are provided to heavily impacted areas.

Using the above assumption, one would then reduce by one third the direct public employment effects caused by federal payment reductions. These effects, although not explicitly discussed in the text, appear from OLSON's Appendix D to average .7 employees per MMBF across his various regions, at least for Forest Service payments. For BLM payments, which are twice as large per MMBF, the direct employment impact averages 1.4.

Applying the above reductions, the resulting direct employment effects would become, respectively, .47 and .94; equivalently, the reductions from OLSON's figures would amount to .23 and .46 direct employees per MMBF for a total reduction of about 460 jobs. Since these state and local government losses are not included in the FS/BLM results, an additional loss of 920 jobs must be added to its direct effects to make the two studies comparable.

3. Road Building Employment

With respect to another ancillary direct employment effect in OLSON, the loss of jobs in road building seems unexceptionable. In fact, the direct loss of about .1 direct job in road construction per MMBF should be multiplied by the 5,400 MMBF obtained by totaling the losses from both private and public harvests (MB&G, Table 2, Page 22). The resulting 540 employees should then be added to direct employment in FS/BLM when making comparisons with OLSON.

4. Paper Production Based on Mill Residues

As already suggested, OLSON takes into consideration a "forward linkage", via residues from lumber and plywood mills, to paper production. Although this is not an ancillary direct employment effect in the usual sense, it is certainly not something that would have been captured automatically by IMPLAN. It is therefore appropriate to add these additional employment effects to the FS/BLM figures because the latter study apparently fails to take this employment into account. This will be a substantial adjustment, since the pulp and paper production based on mill residues accounts for about 16% of OLSON's total direct TLP employment, or a 19% increase in FS/BLM.

Note that, at first glance, OLSON's handling of this effect is somewhat confusing because it appears that all pulp and paper employment has already been accounted for as directly dependent on the timber harvest. However, careful study of OLSON's pages 9-12 and Appendices B & C reveal that double counting has not, indeed, occurred.

B. Differences in Model Specification

The impact models used by FS/BLM and OLSON, as already noted, are both based on IMPLAN (1983), and/or its PC version, Micro IMPLAN (1989), an Impact Planning regional input-output model system developed by and for the Forest Service. Thus, the underlying structures and data bases of the FS/BLM and OLSON models are supposed to be identical. However, there are some

anomalies in the IMPLAN system that require the user to make assumptions about, or adjustments to, certain model parameters. Differences in judgment, experience, or ability among users can, potentially, lead to the use of divergent sets of parameters and cause noticeable differences in the model results

1. Estimation of Regional Purchase Coefficients

Probably the most significant of these anomalies is in the system that estimates the regional purchase coefficients (RPCs). An RPC is defined as the proportion of a good or service purchased in a region that is actually produced by businesses in the same region. Thus the RPCs are the major determinants of the amount of intraregional feedback and, hence, of the extent to which economic impacts continue to ripple through the regional economy rather than escape in the form of purchases from other regions. Briefly, if the RPCs are under-estimated, the indirect and induced multiplier effects of a given change will also be underestimated, and vice versa.

The OLSON study seems to give more overt attention (cf. OLSON's Appendix E) to this problem than does the FS/BLM study. In particular, OLSON finds that the IMPLAN system badly (and unrealistically) underestimates the RPCs for many ordinary services (e.g. repairs and miscellaneous business services) that are generally purchased locally, even in non-urban regions. Such services are a major contributor to the indirect effects generated in the business sector.

Furthermore, he finds for some regions that "other retail trade" (a catchall for most retailing other than "eating and drinking places" in the IMPLAN model system) also appears to have an abnormally low RPC. This would, of course, tend to reduce substantially the induced economic effects generated by household purchases. But of course, it is not always clear how large this RPC should be, especially in non-urban regions, given that residents may make major purchases on shopping journeys, as well as business and pleasure trips, out of their home regions.

2. Adjustments to the RPCs and Potential Errors

In any case, OLSON chooses to adjust these and other RPCs, always in an upward direction, thereby increasing regional multiplier effects and, hence, total employment and earnings impacts. His specific adjustments are documented in his Appendix E. In most cases they seem reasonable, especially in view of the serious underestimation of some RPCs that he was faced with.

It is not clear that Alan Fox, who did the input-output analysis for FS/BLM, made similar adjustments; but he did mention, in phone conversation, having to adjust questionable RPCs. There is no reason, however, to believe that his adjustments were the same as OLSON's. Therefore, one may surmise that part of the difference between the FS/BLM and OLSON results could well have come about through differences in the "adjusted" RPCs.

A further anomaly, not noted by either OLSON or FS/BLM, is that the RPC for "hotels and lodging places" (IMPLAN Sector 471) tends to be extraordinarily large, as estimated by the model system. This presumably reflects the fact that all but the most rural areas are reasonably well supplied with hotel services. However, most demands for hotel rooms by businesses and households in a region are likely to be at travel destinations in other regions, not locally. This is one case where an overly-large RPC can well generate substantial and spurious intraregional effects, presumably affecting the FS/BLM and OLSON results in similar ways.

C. Differences in Model Application

As already noted, the "ancillary employment" factors included by OLSON in his analysis are ignored by FS/BLM. Much more important is the fact that FS/BLM does not include restrictions on private lands in its direct effects, as discussed at length earlier in this report. But aside from these obvious differences, which will be reprised below, there are other more subtle variations in model application that can affect the calculation of indirect and induced regional economic effects, irrespective of the direct effects used.

In evaluating the impact calculations in the two studies, note that they both enter direct effects in a somewhat unusual way. For example, OLSON tries to include all timber-dependent employment as a combined direct effect. Thus his Table 4, Page 8, lists a long series of SIC numbers and corresponding IMPLAN sector numbers for all the forestry, logging, lumber, wood products, pulp, paper, and paperboard sectors (TLP, for short) that he considers dependent on "regional timber harvest." As already noted, he even includes the "forward-linked" pulp and paper employment that is dependent on mill residues.

The only thing that seems to be missing from OLSON's direct effects is Agricultural Forestry & Fishery (AFF) Services, a mixture of SIC numbers defined as IMPLAN Sector 26. This latter is not necessarily only dependent on forestry, although in the regions being studied, Forestry Services are likely to be a disproportionate part of the total.

In order to avoid double-counting, OLSON and FS/BLM both quite properly turn off the internal input-ouput technological linkages among the timber-dependent industries. Thus, for example, a change in the production of lumber will not, in the impact calculations, generate a commensurate indirect change in logging; and of course it should not, given that all logging has already been entered as a direct effect. This is in contrast to the typical impact study, in which one might change output or employment in the lumber products industry and allow sawmills, logging, and forestry to be affected "indirectly".

On the other hand, all of the other indirect requirements of these timber-dependent industries are, indeed, calculated by IMPLAN. This is the major reason why the direct timber industry impact of 7.22 jobs per MMBF of private harvest in Northwest Oregon in OLSON (Table 5d, Page 12, including the residue-using industries) becomes 9.62 direct and indirect jobs per MMBF in his corresponding table in Appendix D.

However, after careful study of this table, again using Northwest Oregon as an example, one wonders about the size of the indirect effects with respect to OLSON's aggregated category AFF (both production and services). Obviously forestry, itself, belongs in this category and accounts for a direct employment of .68 per MMBF of private harvests. Yet the direct plus indirect effects amount to almost twice that number, 1.35.

If one looks carefully at the other components of AFF, one finds that the sector that is the most important input to the timber-related industries is, aside from forestry itself, AFF Services, which OLSON leaves out of his direct effects, as noted above. But the input coefficients for the purchase of AFF services by the timber-related industries are much too small to have generated an additional .67 employee per MMBF. In fact, the total input of all AFF sectors into Logging, IMPLAN Sector 160 (which has the largest AFF input coefficients of all timber-related industries), is only .005 or one

half cent per dollar output; and one quarter of this amount is in forestry which, as noted, is accounted for separately and therefore should not be affected by logging.

This, of course, might raise questions about even the direct forestry employment impact of .68 used by OLSON. However, the input-output coefficients are only national averages, and there may be good reasons for forestry employment per MMBF to be much higher, relative to logging employment, in the Pacific Northwest. But the indirect employment, if correct, should then show up, as well, in the direct plus indirect effects of the FS and BLM harvests because of their similarly large logging component.

On the basis of the foregoing, one can argue that the OLSON results for private harvests should be discounted by at least .5 direct employees per MMBF. This would result in a reduction of about 1790 direct employees for private (and state-owned) harvest losses of 3,584 MMBF across the whole Owl Study Region (MB&G, Table 2, Page 22).

D. Multiplier Discrepancies

1. Multiplier Comparisons: OLSON & FS/BLM

In considering the sizes of multiplier effects, it is much easier to use MB&G because its Tables 5-7 (Pages 25-27) present direct and total jobs in a compact and readable form. What one finds is that the overall multiplier for the 3-State Owl Region (with metropolitan areas included) is 147.2/63.8 = 2.31. The comparable multiplier for FS/BLM is about 2.0 (p. 47, although the exact figure is never made explicit).

Note here that FS/BLM apparently enters, as direct effects, only the wood and paper products industries and then allows the indirect effects on logging, forestry, etc. to be calculated by IMPLAN. However, the employment multiplier is then "back-calculated" by dividing total employment by the sum of all the direct and indirect employment that could be considered timber-dependent. Since the export of logs is not an indirect effect of the wood products industry, such exports were entered as separate direct effects. In essence, therefore, the FS/BLM and OLSON multipliers are directly comparable.

Both multipliers may seem, at first glance, surprisingly high, especially when one realizes that a substantial portion of the indirect effects among the TLP group of industries are subsumed as part of the direct effects in these analyses. However, the relatively high wages of timber and lumber workers, and the relatively low wages of trade and service employees, means that each "direct" worker in the TLP industries can, through household and other expenditures, generate jobs for a disproportionate number of indirect and induced workers.

The foregoing is typical of mining and other resource extraction activities and areas as well. Note, also, that almost all input-output models operate in dollar terms and that the basis for converting dollars into, or out of, employment terms is earnings per employee.

2. Multiplier Variations with Region Size

RSRI constructed a model for Southwest Oregon and applied it in a manner as close as possible to OLSON's. The resulting mutiplier is 2.03, essentially identical to that obtained by OLSON/MB&G

for this region. Although it is not clear that similar results would be obtained for other subregions, there is no reason to believe they would not.

RSRI also constructed a model for the states of Washington and Oregon, singly and in a combined 2-state region. California was not included in the latter because its southern portion is substantially more self-sufficient in almost all goods and services than the Northern California Owl Region (or almost any other entire state, for that matter). Therefore, the multiplier results would have been exaggerated. In any case, the use of the entire states of Washington and Oregon would be expected to capture fully most of the (presumably higher) metropolitan multiplier effects that should be expected to occur, both inside and outside the greater Owl Region.

The employment multiplier results from using RSRI's Oregon, Washington, and 2-state models are 2.19, 2.45, and 2.23, respectively. The discrepancy between Oregon and Washington is due, for reasons similar to those discussed above, to relative wage differences between the TLP group and other industries for the two states. Briefly, Oregon has lower wood products wages per employee than Washington and higher relative wages in trade and services.

The 2-state area captures more of the indirect and induced regional purchase effects of the TLP industries (as evidenced by larger value added effects) than either of the states, alone. But, the employment effects per dollar of value added and earnings are lower because the earnings per "indirect and induced" worker are higher, relative to those of direct workers, than for Washington alone. Similarly, the multiplier effects for the 2-state region are higher than for Oregon because the relative wage situation is exactly reversed.

3. Other Multiplier Estimates

An alternative source of multiplier estimates for the TLP industries in Washington is Conway, Pascall & Pedersen (November, 1990). This study uses the WPSM model, which is based on the highly-regarded, survey-based Washington Input-Output Model developed by Bourque (1987) and his associates at the University of Washington.

Conway et al. report a TLP employment multiplier of 3.6, much higher than anything else reported here. However, the WPSM model takes into consideration a number of factors, including "induced" reductions in state and local government spending, and other long-term dynamic population and income effects; these have been explicitly excluded here, at least in the multiplier calculations, because they cannot be accurately captured by static input-output models like those used in almost all the other studies.

Conway (in a phone conversation) reports, however, that the "straight" input-output multiplier is 2.5. This is almost identical to the RSRI's calculated 2.45 employment multiplier for the TLP industries in Washington.

GJ&L, as previously noted, use an econometric model rather than an input-output model to determine the total employment effects of the direct TLP employment losses in Oregon. However it is easy, given their Table 20, Page 27, to calculate the multipliers implicit in their forecasting system. The numbers for the scenario most comparable with the other studies gives a total loss of 39.8 jobs generated by a direct loss of 17.5 timber-related jobs.

This multiplier, 2.27, is a bit higher than the 2.19 obtained by RSRI and the 1.94 implied by MB&G (Table 7, Page 27) for Oregon. In the case of the latter, of course, the multiplier effect is curtailed by the fact that it is calculated only for the Owl Region (including neighboring metropolitan areas); this region would be expected to have a lower employment multiplier than would the state as a whole. As for the small difference relative to the RSRI estimate, it is very likely that the Oregon state labor market model, like WPSM, takes into consideration effects not included in typical input-output models.

4. A Compromise Multiplier

The result of the foregoing is that the overall OLSON TLP employment multiplier estimate of 2.31 still seems a bit high. If one were to use the MB&G adjustment for technological change (Tables 5-7, Pages 25-27), this would reduce the total employment effects by 10%. This might not alter the multiplier, however, because both its numerator and denominator would be changed. Whether these changes would be such as to keep the ratio the same is a good question: but one could argue that the true multiplier might even go up slightly because productivity changes are likely to reduce employment per unit output faster in the TLP industries than in indirect and induced industries, such as trade and services.

In any case, the foregoing does suggest that the total jobs should, at least after the multiplier analysis, be adjusted for technological change. The RSRI multipliers are based on an update to 1991 technology and productivity, but it is not clear how much technological and productivity change may, or may not, be built into the other models (although they clearly are not included in IMPLAN). Based on the work of both OLSON and RSRI, one could argue that 10% is an appropriate average total productivity increase for the 1991-2000 period.

In considering RSRI's 2-state multiplier of 2.23, one might argue that it should be a bit higher because Washington makes up about 33% of the wood products employment for the two states: the weighted average employment multiplier would thus be 2.28. However, there are other sectors, and other interactions among those sectors, that come into play when two regions are combined. Therefore, the use of the simple weighted average may not be justified.

After considering all of the above, one would certainly reject the nominal FS/BLM TLP employment multiplier of 2.0. In fact, this figure was presented so indirectly and off-handedly in the text as to suggest that it was not intended to be an exact estimate. This would be sensible, given the potential for a variety of estimation errors that can enter into the calculation of even simple input-output multipliers.

Among the remaining estimates, there appears to be a proponde-rance of evidence that the TLP employment multiplier, for the 3-state Owl Region, should be around 2.25. This figure is arbitrary, of course, but it does reflect a compromise among the studies that make serious attempts at accurate estimation; and it is also conservative, avoiding either of the possible extremes.

A Final Set of Employment Impact Estimates

A. Summary of Results:

1. The major differences between FS/BLM and OLSON, aside from the fact that the latter applies restrictions to private as well as public lands, lie in their assumptions about baselines and direct job losses per MMBF of lost harvest. OLSON starts from a baseline of the average 1983-87 harvest and assumes a basic job loss of 6.1 per MMBF. FS/BLM uses "current plans" as a baseline and assumes 5.31 jobs per MMBF. As argued above, the "projected plans" baseline is most appropriate; and, because OLSON documents his job losses so carefully, 6.1 seems more justifiable. One might argue further about these choices, but their effect is to reduce direct job losses by 1730 and 19,500 for FS/BLM and OLSON, respectively.

2. OLSON's application of the restrictions to all lands, public and private, is less subject to argument; it seems clear that this will effectively be the policy followed, given the nature of current federal and state planning and policy development for the HCAs. Other things being equal, the inclusion of private lands would add about 158% to the original FS/BLM direct job impact estimates.

3. One effect of the restrictions on private and state lands would be to mitigate much of the "price response" effect expected by FS/BLM and others. In any case, the lack of sustainability of higher private yields beyond the year 2000, at least until the lumber grown under more intensive silviculture on unrestricted lands becomes available after 2030, means that this factor cannot be relied on to reduce the impacts of harvest restrictions in the HCAs.

4. It is extremely unlikely that any logs will be brought from Canada under any realistic scenario. However, the export restrictions on state and private logs will free up timber for use by domestic processors. Even assuming that some logs will be in the wrong location or of the wrong type, the net total job loss for the 2-state area, due mainly to reductions in public employment caused by revenue losses on state lands, would be only about 510.

5. The designation of CHAs is likely to add 2,490 jobs to the total losses in both sets of results, since this factor was not considered by either FS/BLM or OLSON.

6. The employment impacts of federal timber management and payments in lieu of taxes in the OLSON study seem overestimated. In the case of the former, it appears that about 1570 jobs are already accounted for in the IMPLAN model, so the OLSON direct effects should be reduced by that number. For local government, using the factors developed above, the estimated direct local employment losses due to curtailed FS and BLM payments should be reduced by a total of 460 direct jpbs.

Note, in this regard, that a total of 2420 direct jobs should be added to the FS/BLM losses. The first 920 of these are due to the fact that FS/BLM does not account for local government job losses caused by reductions in payments in lieu of taxes. The remaining 1500 are job reductions at the Forest Service that, although mentioned in FS/BLM, were never included in its totals.

7. Effects on the building of logging roads, and associated employment in that activity, are not considered in the FS/BLM analysis. Taking this into consideration would add 540 to the direct jobs

in this study.

8. FS/BLM also does not include the forward linkages between mill residues and the paper and board industries that use those residues. Adjusting for this adds an additional 19% to the FS/BLM direct employment effects.

9. OLSON's indirect effects in the AFF group of industries seem much to high, given that logging and forestry are included as direct effects. Given the small input-output coefficients for AFF services and the lack of any other significant indirect effect in this group of sectors that is not already accounted for, the OLSON effects need to be reduced by 1790 direct employees.

10. There is evidence that the OLSON multipliers are probably a bit high (and those of FS/BLM more than a bit low). The OLSON overestimation is due, in part, to an anomaly in the indirect AFF effects; in part to the the fact that earnings and productivity may not have been adjusted in OLSON's version of IMPLAN; and perhaps, in part, to over-enthusiastic hand adjustments of some of those RPCs that were poorly estimated by the IMPLAN system. Whatever the cause(s), the weight of evidence suggests that the "correct" overall Owl Region multiplier should be about 2.25.

B. Revised Sets of Employment Impacts

Based on the above, it is now possible to revise both the FS/BLM and the OLSON results. The approach is to take the base level direct employment losses reported and then add or subtract adjustments before applying the multiplier. Strictly speaking, the same multiplier should not be used for the added government and road-building employment as for the TLP industries. However, the direct effects for theses are small enough that such multiplier differences should not have a significant effect on the overall results.

1. FS/BLM

Base Direct Employment Losses	12,700
Subtract to get Common Baseline & Jobs/MMBF	1,730
Subtotal	10,970
Add 158% for Restrictions on Private Lands	17,330
Subtotal	28,300
Add 19% For Residue-Dependent Pulp and Board	5,210
Add for Local Gov. Emp. Based on "In-Lieu" Payments	920
Add for Forest Service Jobs (mentioned not included)	1,500
Add for Logging-road Building Employment	540
Add for Losses Due to Export Restrictions	510
New Total Direct Loss	36,980
2.25 Multiplier	83,210
+ for CHA's	2,490
- 10% Productivity Gain	8,570
Grand Total Regional Employment Losses	77,130

2. OLSON/MB&G

Base Direct Employment Losses	63,750
Subtract to Adjust to "With Plans" Baseline	19,500
Subtotal	44,250
Subtract for Overestimation of Local Government Loss	460
Add for Losses Due to Export Restrictions	510
Subtract for Excess Forest Management Job Loss	1,570
Subtract for Excess AFF Services for Private Harvest	1,790
New Total Direct	40,940
2.25 Multiplier	92,120
+for CHAs	2,490
-10% Productivity Gain	9,460
Grand Total Regional Employment Losses	85,150

C. Concluding Remarks

The purpose of this study was to explain the large differences in results between the FS/BLM and OLSON/MB&G studies of the employment impacts of the ISC Northern Spotted Owl Conservation Strategy on the Pacific Northwest. A secondary purpose was to make an estimate of the total employment effects that could be justified and defended, based on these and other studies and on the models and expertise of RSRI.

The outcome of this study is that the FS/BLM and OLSON/MB&G estimates converge, once basic differences in assumptions and other discrepencies are accounted for. It would be nice if one could reduce even further the remaining difference of about 8,000 total jobs between the two estimates. But the lack of detailed information, especially in FS/BLM, does not make that possible. However, one can be quite sure that the correct result lies between 77,130 and 85,150; the halfway point of about 81,140 would seem like a reasonable choice.

One should bear in mind that the present study, like those that it reviews, focuses primarily on the Pacific Northwest (although the Forest Service's TAMM Model seems to take a somewhat broader national market view). It is not clear at all that sufficient attention has been given to the effects of the projected harvest reductions on the rest of the U.S. economy. The studies that consider this matter tend to reach the same comfortable conclusion: that lumber prices will not rise very much (or alternatively, that here will be no true shortages) because Southern and Canadian lumber mills, and export restrictions, will take up the slack.

However, it does not appear that adequate consideration has been given to the full set of interstate, national, and international effects of the harvest reduction that will be associated with the ISC guidelines and other conservation policies. The interacting effects of these restrictions on the prices, exports, imports, lumber and paper supplies and demands, foreign trade balance and related factors for the U.S. economy as a whole would seem to call for more comprehensive and systematic economic analysis than has been done so far.

It would seem, at a minimum, that the projected changes in the TLP and related industries should be simulated with a national model in order to determine a full set of national economic effects. And the losses in federal, state and local revenues that will be associated with the ISC guidelines deserve consideration in and of themselves, given the precarious fiscal condition of all levels of government at this time. At the very least, the substantial human, economic, and fiscal dislocations that will occur in certain impacted communities will call for some mitigation financed, one would hope, by the larger society that will share in the benefits of these conservation programs.

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TB91-10	Robin M. Reich; Colorado State University "Statistical Review of the 1990 Status Review of the Northern Spotted Owl, Strix occidentalis caurina"
TB91-11	Benjamin H. Stevens; Regional Science Research Institute "Final Report on the Comparative Evaluation of Two Major Studies on the Employment Impacts of the ISC Northern Spotted Owl Conservation Strategy on Washington, Oregon, and California"

* For more information on the Technical Bulletin Series or for a copy of the papers, please contact Carrie Jelsma at the American Forest Resource Alliance at 202/463-2792; 1250 Connecticut Avenue, NW Suite 200, Washington, DC 20036.

Mark
comments on Recovery Plan

TIMBER DATA COMPANY

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Table 1

Summary of harvest impacts by owner class

Federal Lands: Agency estimates under USF&WS Draft Recovery Plan

States: Estimates under first Critical Habitat Proposal

Private Lands: OR and WA based on Survey, CA based on ISC estimates

(MMbf Sawtimber, long log scale)

		Projected harvest for 1991-2000				
	Average	Before Listing		USF&WS Draft Recovery Plan		
State /	Harvest	Planned	% Chng		% Change from	
Ownership	1983-87	ASQ	from Harvest	MMbf	Harvest	Planned ASQ
WASHINGTON OWL REGION						
Federal	942	738	-22%	297	-68%	-60%
Other Public	961	933	-3%	733	-24%	-21%
Private	3,611	3,400	-6%	3,054	-15%	-10%
Total	5,514	5,071	-8%	4,084	-26%	-19%
OREGON OWL REGION						
Federal	3,050	2,633	-14%	1,374	-55%	-48%
Other Public	307	271	-12%	214	-31%	-21%
Private	3,084	2,950	-4%	2,227	-28%	-25%
Total	6,442	5,854	-9%	3,814	-41%	-35%
CALIFORNIA OWL REGION						
Federal	1,038	1,021	-2%	785	-24%	-23%
Other Public	57	33	-42%	5	-91%	-85%
Private	1,692	1,370	-19%	457	-73%	-67%
Total	2,787	2,424	-13%	1,247	-55%	-49%
THREE STATE OWL REGION						
Federal	5,030	4,392	-13%	2,455	-51%	-44%
Other Public	1,326	1,237	-7%	952	-28%	-23%
Private	8,387	7,720	-8%	5,738	-32%	-26%
Total	14,743	13,349	-9%	9,145	-38%	-31%

Note: Federal includes Forest Service and BLM

Source: Adapted from Rasmussen (1992)