

OREGON UPDATE
MIGRANT AND SEASONAL FARMWORKER
ENUMERATION PROFILES STUDY

FINAL

Alice C. Larson, Ph.D.
Larson Assistance Services

P.O. Box 801
Vashon Island, WA 98070
206-463-9000 (voice)
206-463-9400 (fax)
las@wolfenet.com (e-mail)

May, 2013

ACKNOWLEDGEMENTS

This research was greatly aided by the many staff of migrant and seasonal farmworker serving programs throughout Oregon and personnel at the Oregon Employment Department who provided database information and conducted special data runs which allowed a range of information from which to draw conclusions.

Those who participated in interviews, either in-person or by telephone, and others who consulted on various issues via email communication, all offered observations and details without which it would not have been possible to make informed assumptions.

The individuals who, when asked, took time to review and comment on the Draft Report helped to make the final document more accurate and useable.

Finally, the author of this report would like to thank Marc Overbeck, Director of the Primary Care Office, Oregon Health Authority, for his support and encouragement throughout this study. Without his assistance, this Update of the *Oregon Migrant and Seasonal Farmworker Enumeration Profiles Study* would not have been possible.

Estimating migrant and seasonal farmworkers and their non-farmworking household members is an extremely challenging task. This research has attempted to develop a reasonable approach to the estimation process. The user should carefully consider the description of study parameters to understand what is included or excluded from the final figures and the limitations of the research.

It is hoped this document will be found to be helpful in meeting the need for descriptive information on the migrant and seasonal farmworker population in Oregon.

TABLE OF CONTENTS

	<u>Page</u>
DOCUMENT DESCRIPTION	
A. Background	1
B. Study Purpose	1
C. Definitions	2
D. Limitations	5
E. General Process	6
F. Changes from 2002 to 2013	15
G. Indigenous Workers	21
H. Enumeration Methodology and Data Sources	24
 TABLES	
Table One – Oregon Update MSFW Enumeration Profiles Estimates – Final	38
Table Two – Oregon Update Field Agriculture Methods – Final	40
Table Three – Percent Migrant, Percent Seasonal, Percent Accompanied Household Size – Final	43
Table Four – Statewide Oregon Judicial Department Indigenous Language Requests for Calendar Years 2011, 2012	44
 BIBLIOGRAPHY	45

DOCUMENT DESCRIPTION

OREGON UPDATE MIGRANT AND SEASONAL FARMWORKER ENUMERATION PROFILES STUDY

A. BACKGROUND

In 2000, the Migrant Health Program of the Bureau of Primary Health Care, U.S. Department of Health and Human Services, completed a series of reports that provided estimates for migrant and seasonal farmworkers (MSFWs) who are the program's target group. This series covered ten initial states, with seven additional state-level reports, funded by alternative sources, completed between 2002 and 2008.

These reports, identified as the *Migrant and Seasonal Farmworker Enumeration Profiles Study* series, are unique as they present county-level estimates, using state-specific methods, for both workers and associated non-farm working household members. The reports have been widely circulated and reviewed and have gained general acceptance as offering a reasonable approach to estimating this population.

The *Oregon Migrant and Seasonal Farmworker Enumeration Profiles Study* (Larson, 2002) was completed in 2002 as the first study following the initial ten funded by the Office of Migrant Health. Because there is a constant need for accurate and current estimates of the migrant and seasonal farmworker (MSFW) population in Oregon, these estimates have been used by a variety of sources including: government agencies for health care designations and other purposes, non-profit service organizations, researchers, agricultural producers, media representatives, advocates and many other individuals.

The 2002 *Oregon Enumeration Study* is now over ten years old which leaves the question of whether crops, agricultural production methods, and the characteristics of MSFWs have changed. In 2012, the Primary Care Office within the Oregon Health Authority engaged Larson Assistance Services, Alice C. Larson, Ph.D. (author of the *Enumeration Profiles Study* series of reports) to update the study for Oregon.

B. STUDY PURPOSE

The *Oregon Update, MSFW Enumeration Profiles Study* (OR Update MSFW EPS) offers a revised version of the earlier 2002 report, looking at county level estimates for the following three population sub-groups:

- Migrant farmworkers and seasonal farmworkers.
- Non-farmworkers present in the same household as migrant farmworkers and

- seasonal farmworkers (defined by the term “accompanied”).
- Number of people (“children and youth”) under age 20 in six age groups.

Included in the scope of study are individuals engaged in field and orchard agriculture, food processing (sorting, cleaning, packing and similar operations), horticultural specialties (nursery operations, greenhouse activities and crops grown under cover), reforestation (tree planting), and forest gathering (such as ferns, mushrooms, salal, and wreath-making materials). No effort was made to determine legal status of the MSFWs or non-farmworker household members who were estimated.

C. DEFINITIONS

1. Migrant and Seasonal Farmworkers (MSFWs)

For consistency, the MSFW definition used in the 2002 study and all of the reports in the MSFW Enumeration Profiles series is incorporated into this work. It corresponds to that of the Migrant Health Program, in that it describes a seasonal farmworker as:

“An individual whose principal employment is in agriculture on a seasonal basis, who has been so employed within the last twenty-four months.”

A migrant farmworker meets the same definition but “establishes for the purposes of such employment a temporary abode.” (*U.S. Code*, Public Health Services Act, “Migrant Health”)

Although this is the guiding definition for the OR Update MSFW EPS, it could not always be a practical definition. As explained in more detail in the “Limitations” section, many of the methodologies and data used in this report did not clarify whether an individual’s principal employment is in agriculture. The exception would be MSFW-serving program client information as the eligibility regulations for most of these consists of similar employment criteria.

2. Industries Included in the Estimates

In December 2012, the Migrant Health Program changed the agricultural industries included in the definition (U.S. Department of Health and Human Services, 2012) . In regard to what had previously been used to define the population included in the MSFW EPS series of reports, some categories were dropped while others were added.

Because this study was begun on the premise that the definition used would be similar to the earlier 2002 OR MSFW EPS, an effort has been made to keep the categories included in the population the same, while providing enough information to allow those

who will use this report to add in or subtract out groups they either do or do not include in their particular definition of MSFWs.

In particular, Migrant Health added the category of animal agriculture while excluding reforestation and forest products gathering. Because a great deal more research needs to be conducted before a reasonable estimate of workers involved in animal agriculture “on a seasonal basis” and the characteristics of any accompanying household members can be estimated, these groups have not been included in this report.

Each of the four major industry groups for which estimates were developed was defined by a specific North American Industrial Classification System (NAICS) code, which is a means for identifying every industry and sub-industry. Such categorization was often found to be useful for extracting information from established databases.

a. Field Agriculture (Excluding Animal Agriculture)

Field agriculture is included in NAICS identification 111, “crop production,” under the general category “agriculture” (code 11). Additionally, several smaller NAICS subcategories are considered field agriculture, including: 1151 “support activities for crop production,” 115112 “soil preparation, planting and cultivating,” 115114 “postharvest crop activities,” and 115115 “farm labor contractors and crew leaders.”

b. Nursery/Greenhouse

The NAICS code 1114 defines “greenhouse and nursery production.” This falls within the broader “crop production” classification mentioned above.

c. Food Processing

“Food processing” (sorting, grading, cleaning, packing, etc.) is a regular part of crop production but has been an extremely difficult industry to define as it is all-encompassing. For example in just one crop, potatoes, jobs defined as “food processing” range from taking rocks out of harvested potatoes to making French fries. Agricultural producers might do a full range of such activities in one location. In previous MSFW EPS series reports, food processing was identified with two NAICS codes because actual operations are hard to differentiate:

115114: post harvest crop activities.

3114: fruit and vegetable preserving and specialty.

Agricultural producers might be classified under NAICS 3114 (a manufacturing classification which now falls outside the Migrant Health definition) while others might be classified under NAICS 115114 (postharvest crop activities, which would be included in

the definition). Many of these operators could fall under both categories. If a worker cleans a product; as occurs with onions, cherries and a number of other crops; this activity might occur in any number of locations. The worker would be engaged in post harvest activities but might perform this work in a field, a shed or a plant. These are seasonal jobs and are considered to be part of crop production.

An example of this blending of the two NAICS codes can be seen when looking at work history information for MSFWs deemed eligible for two Oregon MSFW-serving organizations. In Migrant Education Program data, there are 171 clients with family members who sort, pack, trim, clean, grade or do other similar post-harvest activities with potatoes (Oregon Office of Education, 2012). These workers might fall either under NAICS 115114 or NAICS 3114, possibly depending on where the task is located. Oregon Human Development Corporation, the National Farmworker Jobs Program in Oregon, lists 68 similar jobs for their eligible MSFW clients who are engaged in potato-related activities (Oregon Human Development Corporation, 2013).

Another example of difficulty making the distinction between the two NAICS codes can be seen when looking at the 955 businesses in Oregon licensed as food processors in 2012 (Oregon Department of Agriculture, 2012). They include 45 which have “farm” and 86 with “food” in their names as well as other businesses which, from the company names, can be assumed are bakeries, sauce makers or other similar operations where the form of the product is likely to change.. For an additional 182 of the licensed businesses it was not possible from the name to tell where they might fall in this spectrum, that is whether or not they might process crops into a new form; e.g., juice; or they might sort and pack crops for direct market. Their license says “food processor” but with a name like “Blueberry Ridge Farm” or “Grateful Harvest Farm”, it might be assumed that they also produce crops. This would make such establishments fall both under NAICS 115114 and 3114, and some might also be classified under other NAICS 111 subcategories related to growing crops.

For the purposes of this study, any data source which specifically identified itself as falling under NAICS 3114 was excluded. The assumption was that most of these jobs might be related more to altering the form of the product rather than tasks related to post harvest crop activity such as cleaning and sorting. The result may be exclusion of some workers who would have formerly been counted under food processing in the MSFW EPS series of reports.

Because of the blending of food processing activities between the two NAICS codes, it is not possible to determine how many workers might have been included in the 2002 OR MSFW EPS estimates who might now be excluded in the 2013 OR Update MSFW EPS. To counteract potential undercounting, an effort was made to develop estimates related to sorting/packing, and other similar activities using the methodologies employed for estimating the field agriculture industry group.

d. Reforestation/Forest Products Gathering

Reforestation falls within NAICS 1153, “support activities for forestry.” Non-timber forest products gathering falls within NAICS 113210, “forest nursery and gathering forest products.” This includes items not systematically grown but found primarily in woods, then gathered, picked or cut and sold to outlets. For Oregon, this category encompasses many products gathered for the floral industry including salal, ferns, wreath-making materials and other items.

D. LIMITATIONS

It is extremely difficult to estimate the number of MSFWs at a county level as agriculture and the individuals employed in it are in constant flux. No database exists that provides a comprehensive picture of this population, and it might be argued that one could never be obtained as the population continually changes in reaction to the demands of agricultural production and influence of other outside factors such as government policies, housing availability, the price of gasoline, etc. The OR Update MSFW EPS is an attempt to piece together all available information concerning MSFWs into a reasonable approximation of worker and non-farmworking family member estimates.

A great deal of effort was expended to locate data sources on this population. Despite this, it is possible that there may be others, unknown to the researcher, which were left out.

Limited resources have prohibited primary research with farmworkers as a means to generate information for this study. Other sources which were utilized did obtain information directly from farmworkers; e.g., client records, and Unemployment Insurance numbers; with the results summarized in quantifiable databases. The duplication across these sources is unknown as is the extent of the population not included. MSFW-serving programs, from which client data were obtained, may be directed toward a particular segment of the population and as such not present a comprehensive picture.

The inclusion of secondary source material has meant taking reports and documents prepared for other purposes and adjusting them, as possible, for incorporation within the study. This has meant that the definition of “principal employment in agriculture” has been difficult to incorporate into the report. For example, demand for labor calculations based on the concept of jobs rather than individuals do not discriminate between those employed casually in agriculture versus workers who rely on this occupation for the majority of their income. An assumption has had to be made for much of the information obtained that the individuals addressed do meet this qualification. On the other hand, utilization of client data from MSFW-serving organizations does provide a source which matches the study definition as most of these programs have similar eligibility criteria.

Utilization of a variety of sources has meant the definition of who is included as a migrant or seasonal farmworker was often tied to the generating source. Wherever possible, screens were used to take out those not covered by the study definition; e.g., exclude individuals employed in animal agriculture.

In several instances, the lack of detailed documents or other data required utilization of knowledgeable individuals to fill in blanks. Only a select number were chosen for interview, and they do not represent all of those who might contribute such information.

The factors developed for this study which relate to the calculation of non-farmworkers in accompanied households and number of children and youth were based on available information, most of which came from direct client counts of MSFW-serving programs. These samplings of the population may not be random as they rely on an individual receiving specific services that might be geared to a particular segment of the population or only offered in certain locations. As much as possible, multiple sources were utilized in an effort to balance any potential bias. Often, however, it was a matter of using the best or only available data with attempts to make adjustments to enhance representation and inclusion as much as possible.

Many sources addressed the MSFW population in only specific geographic areas. For lack of an alternative, it was necessary to assume that the information obtained was representative of all segments of the population in counties across the state.

E. GENERAL PROCESS

1. Basic Investigation Techniques

This study involved the steps outlined below:

- (1) Internet-based survey asking a range of individuals to identify agricultural-related changes, to seek relevant study-related information, and inform interested parties in Oregon the study was underway.
- (2) Basic data gathering and clarification of information, including travel throughout the State which served to verify preliminary estimation factors and identify county-specific nuances which might affect worker or household member estimates.
- (3) Preparation of a Draft Report (estimates, methodology, tables).
- (4) Review of the Draft Report by local knowledgeable individuals.
- (5) Response to reviewer comments and revision of Draft Report as necessary.
- (6) Preparation and issuance of Final OR Update MSFW EPS.

2. Oregon-Specific Large Scale Databases

The following three large scale sources were utilized extensively in the study.

The Census of Agriculture (COA) from the U.S. Department of Agriculture (USDA) is a direct survey of agricultural producers conducted every five years. It asks a variety of information about the components of production including crops grown and acreage involved. The results are offered down to a county level. The questionnaire for the 2012 COA was being distributed during the primary research period for this Study. The Director of the Oregon Field Office of the National Agricultural Statistics Service (OR NASS), USDA indicated data from this survey would not be available until 2014 (interview 2012: Mertz). It became necessary, therefore, to utilize the last COA, the 2007 report. This information was supplemented when possible by updates; e.g., for acreage information.

A special data request was also made of the USDA NASS central office looking at hired workers by county. This information provided a break-down of those employed less than 150 days or workers hired 150 days or more under the two broad categories crop agriculture and livestock agriculture (USDA, NASS, Datalab, 2012).

Oregon Unemployment Insurance Wage Database (OR UI Database), compiled by the Oregon Employment Department (OED), reports number of workers and number of employers categorized by NAICS codes. These statistics are based on employer reports of workers they hire who fall under the requirements of the State Unemployment Insurance System (included are employers who pay more than \$10,000 in wages per quarter or employ ten or more workers for at least 20 weeks). A special data run allowed examination of such information for those working less than full-time. Data from 2007-2011 were examined (OED, 2012).

Client Database Demographic Data, without individual identifying information, was provided by a variety of MSFW-serving organizations in Oregon. These data allowed examination of factors, often at the county level, such as division between migrant farmworker and seasonal farmworker, household size, and percent of children and youth. The organizations providing this detailed information are listed in section “H. Enumeration Methods and Data Sources, 8. Sub-Group Estimates.”

Many other large Oregon-specific databases and resources were utilized to develop these estimates. They are described in the sections to which they pertain.

3. Steps in Development of Estimates

a. Survey

The OR Update MSFW EPS began with a survey to (1) seek information concerning changes in agricultural production and MSFW characteristics from 2002 to 2012, (2) ask

for documentation including data and reports, and (3) alert a wide audience that research to update the OR MSFW EPS had begun.

Individuals throughout Oregon with potential knowledge of agricultural production and/or MSFW characteristics were placed on the survey recipient list including: service, education and health organizations assisting MSFWs; government agencies involved with agriculture and Hispanic issues; university and county-based Extension personnel; farm employer and crop commodity groups; migrant coordinators; and others. All received the survey package which consisted of an introductory email and an attached explanatory letter. Both the email and the letter were sent from Marc Overbeck, Director of the Primary Care Office within the Oregon Health Authority (the funding agent for this study). The notice urged recipients to go to the survey link on the commercial site SurveyMonkey to complete the questionnaire. The communication also provided a link to a copy of the earlier 2002 *Oregon MSFW Enumeration Profiles* report. Two follow-up reminders were sent to those who had been non-responsive.

Approximately 450 individuals received the survey information package. The exact number of recipients is unclear as email addresses were continually updated, recipients forwarded the survey link to others, and public presentations and contacts made by Mr. Overbeck encouraged wide participation. In fact, almost half of all responses, (55) were received from individuals who had not been sent the original survey invitation

b. Site Visit

In September 2012, Dr. Larson spent two weeks in Oregon meeting with knowledgeable individuals involved with agricultural production or associated with MSFW-serving organizations. This trip served to better clarify agricultural changes and practices as well as gather useful resource material.

Dr. Larson had 25 meetings with 58 individuals in the Hood River, Portland, Willamette Valley and west-central Oregon areas. Time prohibited visits with those in far southern or eastern Oregon. She also attended four group meetings with: staff of the Northwest Research and Extension Center, Oregon State University Extension; the MSFW Research Advisory Council of the Office of Health Equity, Oregon Health Division; the MSFW Serving Families Committee, an interagency group that meets to discuss issues around providing assistance to MSFWs; and staff of the Office of Health Policy and Research, Oregon Health Authority.

A large variety of topics were discussed and referrals made to database information and resource personnel. Other individuals were reached via telephone or e-mail to help clarify issues or request specific pieces of information.

c. Additional Data Gathering

A thorough search of related internet sites was undertaken including those specific to: Oregon State University, the Oregon Department of Agriculture; Oregon Office of Employment; USDA-NASS (specifically information produced by the Oregon Field Office), crop associations, and MSFW-serving organization websites, as well as many other entities. Additional information was sought concerning agricultural commodities and production specifics.

d. Preparation of Draft Report

Once all state-specific information was received worker calculations were made and factors were extracted to estimate sub-groups (migrant farmworkers, seasonal farmworkers, and children and youth). For most demographic factors used to develop the estimates, there were numerous sources. These were compared and analyzed to account for any differences, with final results weighted for comparability given differing data sizes.

Working Draft OR Update MSFW EPS figures were compared with 2002 county-level estimates in light of information gathered around changes in agricultural production and the MSFW population. Draft OR Update MSFW EPS estimates were completed and tables prepared. Accompanying narrative was composed to produce the Draft Report for review by knowledgeable individuals.

e. Review of Draft Report

The Draft OR Update MSFW EPS was reviewed by 12 individuals from a variety of disciplines. All of these had previously assisted the research by offering data, information on agricultural production, MSFW characteristics or potential methodologies.

Review comments covered the following general topics:

- Identification of counties where estimates appeared to be under or over what the reviewer expected. There was two counties where different reviewers disagreed on whether the estimates were too high or too low.
- Use of a weighted average for different size databases when calculating the factors to determine non-farmworker estimates
- Need to clarify/better describe the methodological steps employed and study definitions.
- Adding a confidence interval (estimated lower and upper limit) for estimates.
- Completeness of inclusion of all MSFWs in the OR UI Database – why this source could not be considered the definitive estimate for number of MSFWs.
- Including more years in the table listing Oregon Judicial Department

- Indigenous language requests.
- Clarifying potential weaknesses of various databases.
- Offering additional information or data sources.

A response was prepared for each concern, adjustments and clarifications were made, Report language was added to answer issues raised, and further research was undertaken as necessary to adjust Draft estimates for accuracy.

To help look at the reasonableness of Draft Report estimates, figures were compared to other sources offering MSFW numbers at a county level in Oregon. These sources included:

- Clackamas Health Centers, patient database.
- Community Health Centers of Lane County, patient database.
- Community Health Centers, patient database.
- La Clinica del Carino/One Community Health, patient database.
- Mosaic Medical, patient database.
- Multnomah County Health Clinics, patient database.
- Northwest Human Services, patient database.
- Oregon Employment Department, H2A and H2B applications, agricultural and food processing clearance orders.
- Oregon Employment Department, licensed labor camps.
- Oregon Employment Department, monthly Oregon agricultural employment estimates.
- Oregon Health Authority, WIC enrollment database.
- Oregon Human Development Corporation, client database.
- Oregon Office of Education, Migrant Education Program, enrollment database.
- Oregon Unemployment Insurance Database, NAICS code-based tallies for workers employed three quarters or less annually.
- USDA, *2007 Census of Agriculture*, tabulation of hired labor employed under 150 days,
- Virginia Garcia Memorial Health Center, patient database.
- Yakima Valley Farmworkers Clinic, patient database.

In addition, Draft 2013 estimates were compared to the 2002 OR MSFW EPS noting differences with additional research undertaken where these appeared to be out-of-line with what might be expected given agricultural and other county-specific changes.

f. County Adjustments from Draft to Final Estimates

Those counties identified by three or more sources (either reviewers or comparative data) were highlighted for further research. Many approaches were applied in an effort to explain discrepancies. These included:

- Examined the crops grown to look for patterns across the counties; e.g., if the counties pinpointed as possibly having high estimates all produced a specific crop, perhaps the factors used to develop jobs/worker estimates for that crop should be revised.
- For crops grown in these counties, compared acre figures used in the 2002 OR MSFW EPS against acres in the Draft 2013 OR UP MSFW EPS. The earlier report primarily used 1997 COA figures, while the 2013 Update relied mostly on 2002 COA figures.
- Developed profiles for counties in question identifying an expectation of change from 2002 to 2013 (increased or decreased worker estimates) based on a variety of information.

After considerable analysis and consideration, the following changes were made from Draft to Final estimates:

- Changed factors used to estimate specific tasks for onions, Bartlett pears and potatoes.
- Used a consistent duplication rate for all counties.
- Analyzed data specific to counties identified as potentially high or low to determine whether an adjustment was warranted.
- Calculated a weighted average for source data used to develop factors to estimate non-farmworkers in accompanied households.

Harney and Wheeler Counties: Two counties were left out of the Draft estimates, Harney and Wheeler, as there was no indication from crop or nursery/greenhouse data of the presence of seasonal laborers. However, three comparative sources: QCEW, OED Monthly Agricultural figures, and 2007 COA hired workers employed under 150 days; pointed to the presence of at least a minimal number of such workers. (It should be noted that each of these sources presented an unclear picture of exact numbers as each either included more than just field agriculture, did not consider a duplication rate, or may have excluded workers who would be considered part of the estimates for this report.) These source estimates were arrayed to present a range from 108-37.6 for crop workers in Harney and 24–0 for crop workers in Wheeler. The midpoints of these ranges were used as the field worker estimate for these counties (before application of the duplication rate): Harney: 72.8, Wheeler: 12.

Jefferson County: One county, Jefferson, presented a major dilemma as it was highlighted by six different sources indicating the Draft estimates were too low. Comparison with 2002 OR MSFW EPS estimates also indicated a discrepancy. Looking at this county's crop profile did not indicate any crops where workers might have been underestimated, although it was noted the county appears to have added at least two large hand-labor crops (cherries and grapes) since the 2002 estimates. If this acreage has continued to increase in recent years, there is a possibility of more workers; however, no hard evidence of acreage increase is available for use in calculating 2013 OR Update MSFW EPS estimates.

Another change from 2002 to Draft 2013 estimates was the presence of seasonal nursery/greenhouse workers. In 2002, a large number of individuals were working in this industry, while this was not the case in the Draft 2013 estimates. The more recent calculation was based on a source that indicated actual employment for nine months or less (OR UI Database). A conclusion might be drawn that either the nursery/greenhouse industry in this county moved primarily to full-time workers or that seasonal laborers are employed for more than nine but less than twelve months.

Because no firm conclusions could be drawn from hard data about the extent of the underestimate in this county, it was determined that the best course would be to use the numbers available from comparative sources, similar to what was used for Harney and Wheeler Counties. The maximum crop worker estimate ranged from 1464–322. The midpoint, 893, was taken as the duplicated crop worker estimate. No alternative numbers were available with which to adjust nursery/greenhouse estimates.

Wasco County: Wasco County was also investigated to determine if the worker estimate was too low compared to the 2002 OR MSFW EPS estimate. Agricultural employment in this County is predominantly driven by sweet cherries. The number of acres for this crop has increased from what was used in the 2002 OR MSFW EPS, which might lead to the conclusion that worker numbers should also be up. A method similar to what was employed with Jefferson, Harney and Wheeler Counties was applied as a check. This calculation derived a total slightly below the Wasco County OR Update MSFW EPS. Also examined were labor camp occupancy figures for Wasco County in 2012. This figure was also below the estimate. The factors used to develop the 2002 estimate were applied to the sweet cherry acreage figure used in the 2013 estimates, but when these results were averaged into calculations from the other 2013 methods used to estimate sweet cherries, there was little difference found.

A major change in cherry production in the Columbia Gorge, particularly Wasco County, in the last ten years has been a drive to keep workers employed for longer periods of time. As noted in the section of this report detailing agriculture and worker characteristics changes over the last ten years, this has been accomplished by planting cherries at various elevations and growing different varieties, the result being the fruit does not ripen simultaneously. This means, unlike in the past, a single worker can be employed for a longer period so fewer are needed (survey results; interviews, 2012: Dodson, MSFW Serving Families Committee, Nuestra Comunidad Sana, Thompson). Considering this fact and that considerable analysis has not shown anything to the contrary, the Wasco County cherry worker estimates were not adjusted except, as noted above, of changing the duplication rate to the statewide factor.

Coos and Lake Counties: Coos and Lake Counties were examined against the three named data sources (COA, QCEW, OED). The Lake County results showed

the OR Update MSFW EPS estimate to be lower than the midpoint for these sources. Similar to the process described above, the crop worker duplicated estimate was increased to reflect this new information.

On the other hand, the Coos County Draft estimate was found to be higher than the midpoint of the three sources. No additional information could be found to account for this discrepancy. Examining the change in crops grown from the 2002 to 2013 studies, it was seen that a number of hand-labor crops are now being raised in Coos County, although their acreage is small. The crop with the largest number of acres is still cranberries. This is a crop that has become increasingly mechanized, and in 2002 only factors for wet processed berries were used. An adjustment was made to include only 30% of the cranberry crop, which is the percent estimated to be wet processed. This change decreased the County crop worker estimate.

Crook, Marion, Tillamook and Union Counties: The midpoints of the ranges provided by the three identified sources were compared to the Draft estimates for Crook, Marion, Tillamook, and Union Counties. The results were found to be below the OR Update MSFW EPS estimates so no adjustments were made.

g. Other Adjustments from Draft to Final Report

The concerns raised by reviewers were addressed within the Final Report, including the addition of clarification language, more detailed description of approaches, and language insertions as suggested. This included weighting of sources used to calculate non-farmworker factors and addition of a confidence level/range to MSFW and non-farmworker estimates.

An additional issue, the completeness of the OR UI Database, involved research into the reasons MSFWs might be excluded from this source. Dallas Fridley, Regional Economist with OED, provided information relevant to his efforts to estimate the extent of agricultural workers not included in the database due to exclusions from coverage. In looking at only NAICS 111 (crop agriculture) for 2010, he estimated 7.1% of the total population would not be in this database (Fridley, email: December 18, 2012). This is the only attempt to estimate the undercount which could be located.

Consultation was conducted with other knowledgeable individuals including two associated with OED: Mary Lewis, Claimant Re-Employment Coordinator and past long time MSFW Monitor Advocate, and Fernando Gutierrez, current MSFW Monitor Advocate; and three sources who work with MSFWs in a service or legal capacity: Michael Dale, Executive Director, Northwest Workers Justice Project, Peter Hainley, Executive Director, CASA of Oregon, and Nargess Shadbeh, Director, Oregon Law Center, Farmworker Program. They provided a list of reasons why MSFWs might be excluded from the OR UI Database (email: Gutierrez, 2013; Lewis, 2013; and Shadbeh, 2013; telephone conversation: Dale, April 26, 2013; Hainley, 2013; and Lewis, 2013).

- Many MSFWs work short-term jobs and may not qualify for inclusion in the system with any one agricultural employer. Ms Lewis conducted research in 1995 which looked at QCEW figures and tax records to estimate that 4,500 agricultural employers paid some amount of wages but were excluded from UI coverage. It could not be determined how many individuals were hired by these employers, but their wage payment or employee numbers did not meet the threshold for inclusion in the UI system (telephone conversation: April 25, 2013).
- Staffing agencies are used to supply agricultural workers. Some of these may be registered as farm labor contractors, but when they report wages into the OR UI system, they are listed under a non-agriculture NAICS code which covers their broad-based employment activity. The extent of the use of staffing agencies across Oregon is unknown and varies by county.
- There may be agricultural employers and farm labor contractors who are not reporting workers and wages as required. This may be a purposeful decision or may be due to failure to understand reporting/tax payment requirements.
- More than one worker may use the same social security number, the identifier for system recordkeeping. The result would be two or more workers reported as a single worker in the database.
- An employer engaged in crop agriculture may have his workers listed under a NAICS code related to another industry in which he is engaged. An example might be an employer who works with both crop and animal agriculture listing his workers only under the NAICS 112 (animal) agricultural code.

In addition to these general reasons for an undercount, the way the data were configured for use in this study might be a factor. OR UI Database figures are reported quarterly, and the worker data used noted those employed nine months or less. Many workers may be hired by a single employer for more than nine months but not full-time. They would be excluded from the figures used in this study.

For all of these reasons, the conclusion was reached that the OR UI Database was a very useful information source, but, similar to other databases included in this study, could not be considered all-inclusive.

4. Presentation of Estimate Results

The OR Update MSFW EPS summarizes MSFW estimates and presents data used within three summary Tables.

- Final, Oregon Update MSFW Enumeration Profiles Estimates.
- Final, Oregon Update Field Agriculture Methods.
- Percent Migrant, Percent Seasonal, Percent Accompanied and Accompanied Household Size, Final.

F. CHANGES FROM 2002 TO 2013

1. Survey Results

A total of 111 individuals responded to the survey. They represented 25 counties across Oregon, with the greatest (17%) from Washington County. Those from Portland (Clackamas/Multnomah/Washington Counties) represented 11% of respondents, while an additional 10% were from Salem (Marion/Polk Counties).

Slightly over 40 percent (41%) of respondents were associated with health. This category included primarily those employed by health centers or health departments. Almost a quarter of respondents (21%) represented the agricultural industry including vineyard operators, extension agents, crop association personnel and others. Education made up 19% of respondents. This involved both those associated with Migrant Education and early childhood education programs. The remaining respondents were from a variety of service types including: advocacy (5%), legal assistance (5%), research (3%), employment (2%) and housing (2%).

Over a third of respondents (39%) were administrators of some sort, including Project Directors, CEOs and CFOs. Outreach workers made up 22% of those responding to the survey and growers comprised 18%. The latter category was driven primarily by those involved in vineyard operations/grape growing thanks primarily to response encouragement offered from the Oregon Wine Board. Other position types represented by respondents consisted of: clinicians (6%), agricultural extension personnel (5%), and researchers (4%).

Agricultural Changes: Respondents were asked if they felt there had been changes within the following agricultural areas over the past ten years: crops, agricultural production, nursery/greenhouse, food processing and reforestation

A greater proportion of those answering indicated they were aware of changes in crops than was true for any of the other agricultural industries. These responses were almost split in their assessment of whether there had been agricultural production changes over the last ten years. It should also be noted that between 44% and 49% of those replying to questions concerning the nursery/greenhouse, food processing and reforestation industries indicated they did not know if there had been changes.

The following were pinpointed as agricultural changes in the last ten years:

- Vineyard operations have increased dramatically requiring more hand laborers.
- Blueberry acreage has increased but there have been large losses in the strawberry crop.

- Overall crop acreage and tree fruit orchards may have declined due to a number of factors including increased mechanization, economic issues and more grape production.
- Decrease in nursery jobs since 2009 as many products are related to landscaping, a segment hurt by the downturn in the housing market.
- Unclear whether there has been an increase or decrease in food processing, which may vary across the state with some operations closing while new ones have opened.

MSFW Characteristics: Respondents were asked to verify the MSFW demographic factors used in the 2002 Oregon MSFW EPS report. Most indicated they did not know if these were accurate, but of those who hazarded a guess, less than one-fifth felt any of these factors had changed. The exception was the question of migrant/seasonal split for the farmworker population, where respondents felt this varied per county but they had a general sense there were more seasonal workers and fewer migrants.

When asked to explain why demographic factors, particularly the migrant/seasonal split, may have changed, respondents presented as evidence the closing of migrant camps or their occupancy by groups other than migrant farmworkers. Reasons for less migrants included fewer jobs, people returning to homes outside the United States because they could not find work, change in the Oregon driver's license law which hampered the ability of migrants to travel, and immigration-related fear making families afraid to move around.

2. Changes Noted Through Documentation and By Knowledgeable Experts

a. General Themes

Those interviewed consistently pointed to the following three topics as related to changes in agricultural production or MSFW characteristics from 2002 to 2012: specific crops increasing/decreasing or factors in the agricultural industry (some driven by the mid-2000 recession), differences in production methods, and immigration-related fear.

b. Changes in Crop Production

Grapes/Wine: There was general consensus around major growth in the wine industry over the last ten years and agreement that wine production will continue to increase in Oregon (interviews, 2012: Bartholomew, Office of Employment Development, Ramirez, Yasui). A 2011 report by Full Glass Research, "The Economic Impact of the Wine and Wine Grape Industries on the Oregon Economy," noted "from 2000 to 2010, the wine grape acreage has increased 93% [while] the number of Oregon wineries crushing grapes increased by 58%" (Full Glass Research, 2011, p. 3). Leigh Bartholomew, Vineyard Manager for Archery Summit

Winery, echoing findings from this report, noted wine production had weathered the recession as “wine is no longer seen as a luxury item but is expected to be on the table” (interview: 2012). Oregon’s industry adjusted by offering what the market wanted, more value priced wines to accompany their already established quality product. Ms. Bartholomew noted “the future is bright” with vineyards starting to plant again, a finding similar to that in the Full Glass report.

Another indicator for the future has been the construction of the Southern Oregon Wine Institute in Roseburg, a cooperative effort in the Umpqua Wine Region of southwestern Oregon, where experts were commissioned to look at wine production around Walla Walla Washington as a model for what might be expected with an increase in wineries and associated tourism in their area.

Blueberries: Blueberry acreage was said to be increasing dramatically. (interviews, 2012: MSFW Serving Families Committee - Aduviri and Ramos, Northwest Research and Extension Center - Bondi, Ramirez, Yasui.). Claims of positive health-related properties have increased consumer demand, foreign markets are opening for export, and organic production has taken off (interviews, 2012: MSFW Serving Families Committee – Aduviri, Office of Employment Development, Pond, Renquist).

While this historically hand-labor crop is increasing, what it means for MSFWs is not clear. Growers are very concerned over not having enough workers, for various reasons, to perform intense harvest activity and are increasingly turning to mechanization. However, the current utilization of this equipment to replace hand labor is unknown. Growers prefer hand laborers who can be more discriminating in picking berries of a certain color and density, but their concern over labor availability currently affects harvest decisions. Because the mechanical harvest equipment available now may cause damage to the bushes and can be expected to result in a percentage of waste from crushed berries, labor availability will drive the development of more discriminating mechanical harvesting devices in the future (interviews, 2012: Northwest Research and Extension Center - Strik, Office of Employment Development, Oregon Law Center group interview – Shadbeh, Renquist).

After discussion with many individuals regarding this subject, the conclusion appears to be that the choice of using hand laborers for harvest is driven by two things: the availability of workers and the market price. For many operations the following pattern appears to be true. The first harvest pass is conducted by hand as market prices are high when the season begins. The last pass (possibly the third field harvest) is performed by machine as much of what is harvested might go to processing so damage to the berries is less of a concern. Harvest activities in the middle might be performed either by hand or by machine (interviews, 2012: Office of Employment Development, Lake, Renquist).

Cherries: Within the major cherry growing area, sweet cherry production is increasing (interviews, 2012: Godfrey, MSFW Serving Families committee, Nuestra Comunidad Sana, Yasui; publications: Oregon Child Development Coalition, 2011). This appears to be particularly true in Wasco County where acreage is expanding southeast from The Dalles and into Sherman County (interviews, 2012: Branson, Dodson, Godfrey; publications: Oregon Child Development Coalition, 2010 – Hood River and Wasco County Community Assessments). This industry has been notorious for a very short harvest period, making it a struggle to obtain enough workers for the intense seasonal need. Efforts are being made to keep workers around Hood River and Wasco Counties for a longer period of time and to offer housing, particularly in Wasco County, to encourage their continued presence.

Other Crops: Those interviewed indicated they felt there was an increase in other crops; such as garlic, which is mostly mechanically harvested, and hops (interviews, 2012: Office of Employment Development). Pears were said to be about the same, while apples and strawberries have decreased (Godfrey, Oregon Law Center group interview, Ramirez, Yasui). Additionally, there appears to be a growing organic crop industry across the State. Although 2008 figures indicated Oregon was fifth in the country for number of organic farms, no updated numbers could be found for verification (interviews, 2012: MSFW Serving Families Committee – Aduviri; publication: Tauer, 2010).

On the other side, sources indicated there has been a decrease in the strawberry industry (interviews, 2012: Oregon Law Center group interview, Ramirez; publications: Oregon Child Development Coalition, 2010).

Nursery Industry: As noted by the Oregon Board of Agriculture in their 2012 report, “State of Oregon Agriculture,” the nursery/greenhouse industry, at \$667 million for 2010, was ranked first in Oregon’s agricultural production. Nurseries were hit hard by the recession in 2007-09 as much of Oregon’s production was tied to ornamentals and landscaping which were related to the slumping housing industry (interviews: Dodson, Northwest Research and Extension Center - Rosetta, Office of Employment Development, Oregon Law Center group interview; publication: O’Connor, 2012). Many smaller producers failed -- one estimate given was 40% (Northwest Research and Extension Center - Rosetta). Growers began to change their practices to keep a smaller but more stable workforce. Many of those remaining increased the variety of crops they grew to provide longer employment, while others moved to more efficient means of operation which utilized greater mechanization. Currently, some of those interviewed felt the industry is regaining momentum as housing rebounds, but they are not clear whether this means more use of hand laborers or whether the industry will try to increase efficiency and mechanization (1-Rosetta, 1 – Santamaria)

Food Processing: Several reports indicated that although many other Oregon industries suffered through the recession, this was not true for food processing.

Assessing the situation for 24 counties in Central Oregon running from the Columbia Gorge to the California border, OED analyst Dallas Fridley noted growth in food processing jobs and payroll from 2007 to 2011, with a 2010 to 2020 upward trend of 8 percent (Fridley, "Recovery Remains Elusive for Key Manufacturing Industries in the Mostly Rural TOC/OWA Region," 2012). A similar growth projection in jobs was seen for almost every other county in Oregon, with one analyst noting that in 2011, food manufacturing accounted for employment for close to one-fifth of the Hispanic workforce in Marion, Polk and Yamhill Counties (Crollard, 2011; Eagan, 2011; Knoder, 2011; Kraal, 2013; O'Connor, 2010; Rooney, 2012).

c. Immigration-Related Fears

Concern over immigration affects both MSFWs and growers. This issue was said to contribute to the increase in workers settling in Oregon rather than continuing to migrate, an influx of settlers from other states, and changing agricultural practices.

Tighter surveillance measures make international travel more difficult as does a fear of violence and kidnapping and an increase in expense requiring payments to both gangs along the border as well as coyotes assisting in border crossing. A result has been that those attempting a border crossing often leave their families at home. Individuals who in the past regularly returned to Mexico during the slow agriculture winter months now stay put as they find it difficult to return to the United States once they leave. Fear of being deported has become a major driving force (interviews, 2012: Dodson, Nuestra Comunidad Sana, Ramirez, MSFW Serving Families Committee – Amas and Fernow).

As noted by Donalda Dodson, Director of Oregon Child Development Corporation, the state Migrant Head Start provider, "It used to be that people picked up [by Immigration authorities] were back by the end of the week. Now they have their kids with them in the fields as they are afraid they will be picked up and separated from their children." (interview, 2012).

Pressure in other states which have instituted very restrictive anti-immigrant measures has encouraged MSFWs from Alabama, Arizona and Georgia to move to Oregon where they feel more comfortable. However, an Oregon provision requiring proof of citizenship to obtain a driver's license has caused many to stop driving. This has also encouraged settling out of the migrant stream and, as noted by several of those interviewed, resulted in a thriving taxi business driving those without documentation to jobs, shopping, schools, and other places (interviews, 2012:, MSFW Serving Families Committee – Fernow, Office of Employment Development, Oregon Law Center group interview, Ramos).

d. Changes in Agricultural Production Methods

Driven by concern over labor shortages, for which many agricultural producers indicate immigration issues play a key role, growers are changing their practices in an effort to

keep their workers around longer (interviews, 2012: Branson, Dodson, Northwest Research and Extension Center – Rosetta, Nuestra Comunidad Sana; publications: Schick, 2012). This includes producing a variety of crops to keep workers occupied between periods of high labor need in their major production crop and increasing the peak season length for hand-labor activity, such as harvest. A prime example is cherry production which was said to be adding more varieties that ripen at different times, working with land elevations so that not all fruit ripens simultaneously, planting smaller trees so pruning and harvesting will not require ladders, and even adding acreage in new geographic areas anticipating varied ripening times(interviews, 2012: Dodson, MSFW Serving Families Committee, Nuestra Comunidad Sana, Thompson)

e. Demographic Changes

When the comments of those interviewed were reviewed, no clear pattern was seen around changes in the presence of migrants versus seasonals. Several indicated certain crops tend to be worked more by one group or the other, possibly related to the availability of housing (interviews, 2012: Bartholomew, Branson, Nuestra Comunidad Sana, Office of Employment Development, Oregon Law Center group interview - Hoefler). Others felt more people were ceasing travel and becoming seasonal rather than migrant workers (interviews, 2012: Migrant Serving Families Committee - Fernow, Moreno, Oregon Law Center group interview, Ramirez). Some also noted families were settling in Oregon while the male of the household continued to migrate for agricultural work either in Oregon or outside the state (interviews, 2012: Branson, Oregon Law Center group interview – Hoefler and Shadbeh, Ramirez, Ramos; publications: Oregon Child Development Corporation, 2010 - Jefferson County Community Assessment). Jonathan Fernow, Director of the Oregon Migrant Education Program, suggested these additional reasons why migrants might be settling out (Fernow, email: 2013):

- Labor camp owners, having invested in improving their facilities, now charge \$10 per person. This discourages migrants from bringing family members who are too young or for other reasons will not be employed as a farmworker.
- Families, valuing education, do not want to pull their children out of school to travel with them.
- The high cost of gas makes farmworkers hesitant to travel.

There was also no strong pattern seen for a change in the number of accompanied versus single workers. Again, some of those interviewed indicated it might depend on the type of housing which was available (interviews, 2012: Dodson, Godfrey). One individual indicated the mix can vary every year (interview, 2012: Nuestra Comunidad Sana).

f. Farmworker Numbers

There was no clear sense among those interviewed for this study whether farmworker

numbers have increased or decreased in the last ten years, with those interviewed weighing in on both sides (interviews, 2012: Bartholomew, Northwest Research and Extension Center – Rosetta and Santamaria, Office of Employment Development – Quinones, Oregon Law Center group interview, Ramirez). For some industries; e.g., nurseries, there was a sense of fewer workers (interviews, 2012: Northwest Research and Extension Center – Rosetta and Santamaria). For others; e.g., wine grapes, there was a feeling the number of involved workers had increased (interviews, 2012: Bartholomew, Ramirez). A conclusion that might be reached from these discussions with many knowledgeable individuals who interact with the population through a variety of means is that the number of workers has not changed dramatically over the last ten years.

The “Agricultural Outreach Plan” for 2012, prepared by WorkSource, OED, makes the following prediction in regard to Oregon’s agricultural workers: “Even where technology advances may reduce or change some labor needs . . . , much of the work in Oregon agriculture remains labor-intensive.” (p. 6).

G. INDIGENOUS WORKERS

As part of the OR Up MSFW EPS, the researcher was asked to investigate the presence of and health care accessibility for Indigenous MSFWs in a general sense. Some of this concern arose over the fear that because Indigenous peoples may not speak either English or Spanish but a variety of languages (some suggest there can be as many as 37 although there are 5 primary ones), their receipt of health care and other services may be hampered.

These inquiries occurred as other information for this study was gathered. To really do justice to this topic it would be necessary to conduct much more in-depth research to determine the number, location, characteristics, and issues facing Indigenous workers and their family members. The information provided here might be considered a prelude to such additional research.

Non-profit organizations, various individuals and the Indigenous community in Oregon have been national leaders in orienting services to assist Indigenous populations (both through developing specific materials and hiring Indigenous staff), in conducting research on this group, and in the formation of associations of Indigenous peoples. Some of this includes:

- *Globalization, the State, and the Creation of Flexible Indigenous Workers: Mixtec Farmworkers in Oregon*, by Lynn Stephen, one of the first publications examining Indigenous workers in Oregon, 2001.
- “Indigenous and Mestizo Mexican Migrant Farmworkers: A Comparative Mental Health Analysis,” an article in the *Journal of Rural Community Psychology* by William Donlan and Junghee Lee, looked at mental health and ethnicity for a sample of Indigenous and Mestizo Mexican farmworkers in Oregon.

- OCIMO – an organization of Indigenous leaders in Oregon.
- Partnership among the Oregon Law Center Farmworker Program, PCUN, Emory University, Portland State University, the University of Pennsylvania and Farmworker Justice conducting on-going studies since 2006 around occupational health and Indigenous workers. These projects have resulted in several publications and the formation of Community Advisory Committees composed of Indigenous people.
 - Stephanie Farquhar, et. al, “Occupational Conditions and Well-Being of Indigenous Farmworkers,” American Journal of Public Health, 2008.
 - Julie Samples, et. al, “Pesticide Exposure and Occupational Safety Training of Indigenous Farmworkers in Oregon,” American Journal of Public Health, 2009.
 - Valentin Sanchez, “Indigenous Farmworkers Lead the Way in Addressing Occupational Health and Safety: The Role of Community Advisory Committees,” a presentation to the Northwest Environmental Health Conference, Portland, OR, 2012.
- Partnership among the Oregon Law Center, PCUN and the Virginia Garcia Memorial Health Center, “Project Against Sexual Assault of Indigenous Farmworkers,” funded through local and national private foundations from 2007-2012 to assist Indigenous individuals in developing community leadership, improving access to care and advocating for change around workplace sexual harassment and abuse.

Three other publications looking more broadly at the population were also located.

- “Indigenous Farmworkers Face Unique Barriers to Healthcare,” by Alexis Guild of Farmworker Justice (presents a summary of the issues facing Indigenous receipt of health services).
- National Center for Farmworker Health, “Indigenous Farmworkers,” 2011 (a review of facts and literature regarding this population).
- *California’s Indigenous Farmworkers*, a landmark study conducted by Richard Mines, Sandra Nichols and David Runsten for the California Endowment, 2010.

Interviews conducted for this study both with individuals familiar with Indigenous workers or who are themselves from an Indigenous culture, pointed out that this population is not new to Oregon, and many Indigenous individuals were in the State as early as the 1980s (interviews, 2012: Nuestra Comunidad Sana – Sprager, Oregon Law Center group interview – Hoefer, Ramirez, Ramos, Yasui).

Several stated a considerable percent of migrants coming to Oregon are Indigenous individuals (interviews, 2012: MSFW Serving Families Committee, Moreno, Office of Employment Development, Yasui). One estimate is that as high as 30-40% of all Oregon MSFWs are Indigenous (Sanchez, 2012). Many of those interviewed said there are large numbers of Indigenous families annually traveling in groups from California to Oregon to work a specific crop, including: cherries, blueberries and grapes (interviews, 2012: McGrath and McCulley, Nuestra Comunidad Sana, Office of Employment

Development, Ramirez). On the other hand, it was said there were few Indigenous nursery or food processing workers (interviews, 2012: McGrath and McCulley, Northwest Research and Extension Center). Others indicated it is difficult for a grower or anyone to know if someone is Indigenous as lack of proficiency in either English or Spanish may be masked by someone who speaks one of these languages representing the group (interviews, 2012: Godfrey, Northwest Research and Extension Center).

Established populations of Indigenous peoples were noted as living in Woodburn and other parts of Marion County. Also mentioned was Washington County and migrant Indigenous workers traveling to Wasco County. Supplementing this location information is data from the Oregon Judicial Department indicating language assistance requests for those speaking Indigenous languages in 2011 and 2012. This information is summarized in Table Four. Requests were received from 10 Oregon counties in 2011 and 6 in 2012, primarily Marion, Multnomah and Washington Counties for both years.

The following potential access barriers for Indigenous peoples seeking health care in Oregon were noted in publications and through interviews:

- Patients unable to speak English or Spanish and no one on staff at health care provider sites able to communicate in the patient's language.
- Inability to locate adequate translation assistance.
- Failure to understand Indigenous cultural beliefs and practices.
- No uniform written form associated with the Indigenous language.
- Patient not being identified as Indigenous for a variety of reasons, and possibly being mistaken as someone fluent in Spanish because of a Spanish-surname and rudimentary grasp of the Spanish language.
- Indigenous peoples not trusting Spanish-speaking individuals as they faced discrimination from such persons in their home country.
- Lack of outreach into Indigenous communities to encourage utilization of health services and build trust.
- No staff members from Indigenous cultures at health centers.
- Patient lack of trust in established health care facilities.

In an attempt to look for an indicator of the presence of Indigenous peoples in Federally Qualified Health Centers (FQHCs), those offering patient demographic data for use in this study were asked to note the primary language of the MSFWs they serve. Some caution is given in utilization of these figures as it was noted the answer to this question is not always captured by health center staff, and, for reasons stated above, FQHC staff may not always know they are talking to an individual from an Indigenous culture. Of the 12 FQHCs supplying this information, only 3 indicated any patients speaking an Indigenous language, and the percent of all patients seen through a five year period at these three health centers who met this qualification ranged from 3% to .05%. Several other health centers noted an "other" language category containing a small number of entries which might include Indigenous languages. These results could indicate a low number of Indigenous people served at the responding FQHCs; however, no firm conclusion can be drawn due to language recording and identification difficulty issues.

The Oregon Judicial Department data regarding requests for assistance with Indigenous languages for 2011 and 2012, presented in Table 4, lists 15 different languages and a 63% increase between the two years (from 59 to 96 assistance requests).

H. ENUMERATION METHODOLOGY AND DATA SOURCES

Different methods were used to estimate workers in the four separate industry classifications within the study (field agriculture, nursery/greenhouse -- crops grown under cover, food processing and reforestation/forest products gathering). Adjustments were made to worker estimates to account for duplicate counts within and across jobs per employer. Finally, population sub-groups and the number of children and youth in specific age categories were calculated. The legal status of those performing agricultural activities was not a factor considered for this study.

1. Field Agriculture

a. General Methodology

The field agriculture estimate primarily used a “demand for labor” (DFL) process that examined the number of workers needed to perform seasonal agricultural tasks where extensive hand labor is involved: harvesting, planting, pruning, weeding and thinning operations. Sometimes sorting, grading, packing and boxing operations are included in these estimates because DFL techniques were used in their estimation.

DFL results estimate the number of full-time equivalent (FTE) hand labor “jobs” available during the period of peak labor demand for crop production. These calculations, prepared for each crop in every county, were derived through a formula using four elements:

$$DFL = \frac{A \times H}{W \times S}$$

Where:

A = crop acreage.

H = hours needed to perform a specific task (e.g., harvest) on one acre of the crop.

W = work hours per farmworker per day during maximum activity.

S = season length for peak work activity.

Because of the difficulty of obtaining factors in the DFL formula for every crop and task, information was sought from agricultural producers, university-associated extension

personnel and others knowledgeable of crop production to develop field agriculture estimates for a specific task utilizing a “rule of thumb” method. This involved an expert sharing a standard around so many workers per acre of crop needed to perform a specific task, or an actual producer indicating they hire a specific number of workers to perform a task on a set number of acres.

When field agriculture estimates for specific crops and tasks could be made using these two methods, DFL and rule of thumb, the results were averaged to derive one figure for each county crop task. Table Two, “Oregon Update Field Agriculture Methods,” offers information by crop and task for DFL, rule-of-thumb or other methods used to make estimates.

Additionally, there were other variables that relate to accurate estimation techniques for specific commodities. For example, sometimes there was a difference in harvest methods depending on whether the final usage is for fresh market or process. Table Two also notes where such variables were considered in the calculations.

The last step in development of field agriculture estimates involved summarizing calculated job figures by county and translating these into worker counts. As discussed in the section on Duplication Rate, factors were applied in consideration of activity in more than one crop-related task by a single worker.

b. Data Sources/Calculations

Data were gathered from the sources listed below for DFL factors and rule-of-thumb methods. Refer to Table Two for crop specific details.

Crops Requiring Temporary Hand Laborers: The 2002 Oregon MSFW EPS identified crops grown in Oregon that usually require hand labor. This list was updated through data in the 2007 COA and also by discussion with knowledgeable experts to determine current production methods.

Acreage: The 2007 COA was the base source for acreage numbers in identified hand labor crops by county in Oregon. Updates from publications of the OR NASS were used when possible. Many of these were developed by or published in conjunction with the Oregon Department of Agriculture, Oregon State University, and crop/industry-specific associations.

- *Oregon Nursery and Greenhouse Survey*, 2011.
- *2010 Oregon Vineyard and Winery Report*, 2011.
- *Oregon Christmas Trees*, 2011.
- *2010-2011 Oregon Agriculture & Fisheries Statistics*, 2011.
- *Oregon Agripedia*, 2011 Edition.

Previous work on the MSFW *Enumeration Profile Study* series found, through discussion with agricultural experts, that crops of less than ten acres are more likely

to have harvest tasks performed by family members than by hired workers. Accordingly, any crop within a specific county noting such small acreage was dropped. Work on the 2002 *Oregon MSFW Enumeration Profiles Study* included consultation with Diane Coffman of Oregon State University, North Willamette Research and Extension Center who indicated this ten acres rule is less likely to apply in berry crops. Accordingly, production of five or more berry acres was included in estimates.

Some of the crop by county acreage data for the target crops were not reported in COA information although the number of farms in the county producing the crop was indicated. This suppression occurs for figures “withheld to avoid disclosing data for individual farms” (USDA, *2007 Census of Agriculture*, 2009). The following steps were used to calculate county-level acreage based on the figures which were disclosed for a specific crop:

- Add the number of crop acres accounted for in counties where such information is available.
- Subtract the result from the state total number of acres to derive acres unaccounted for within the state.
- Add the number of farms in the counties where acreage is unaccounted.
- Divide unaccounted acres by the number of unaccounted farms to derive an average for acres per farm.
- Multiply this acre average by the number of unaccounted farms in each county.

Hours for Task: The number of hand-labor hours needed to perform a specific task on each crop was derived from crop budgets and other production reports prepared by University Extension programs throughout the country. A primary source was the unpublished *Washington Update, MSFW Enumeration Profiles Study* completed in 2009. Oregon and Washington grow the same crops utilizing similar production methods. Hours for task calculations were updated for that report and used as a base for the OR Update MSFW EPS. A web search was conducted for more recent information developed by other university-based Extension programs, and data found for 2011-2012 were incorporated into hours for task calculations. Often the resulting figure became an average of factors found in the Washington report and a variety of crop-specific sources produced by:

- University of Wisconsin, 2012.
- Clemson University, 2010-2012.
- University of California, Davis, 2011.
- Oklahoma State University, 2012.
- University of Idaho, 2011-2012.

The following additional sources also provided information:

- Various “Crop Profiles” produced by Washington State University.
- Knowledgeable experts (Gempler, 2008; Schreiber, 2008; Smith, 2008).

Work Hours: The U.S. Department of Agriculture “Farm Labor Report” provides quarterly data for agricultural work hours per week. These are reported by region with the Pacific Region comprised of Oregon and Washington figures. Quarterly data were averaged to obtain an annual figure and similar information for the five year period 2008-2012 was averaged to derive a final hours per week number. This figure was divided by an estimated five work days per week to calculate a daily work hours figure of 8.09.

Season Length: The primary source for season length data was the unpublished *Washington Update, MSFW Enumeration Profiles Study*. These season length estimates came from the following sources:

- U.S. Department of Agriculture, National Agricultural Statistics Service, Washington Field Office, “Washington Agricultural Statistics,” 2008.
- Crop profile reports prepared by staff at Washington State University.
- Knowledgeable experts within the State of Washington (Gempler, 2008; Mayer, 2008; Roy, 2008; Smith, 2008; Waters, 2008)

In addition, updated season length information was obtained from:

- University of California, Davis, 2011.
- University of Idaho, 2011-2012.

Any information reported in calendar days was converted to work days by dividing the total number by seven to derive number of weeks and then multiplying by five for number of average MSFW work days per week.

Rule of Thumb Factors: Production formulas based on workers per acre are identified as “rule of thumb” factors. These were offered by a variety of individuals who were familiar with or producing a specific crop and are judged to be based on practical experience. Many of these were obtained during Oregon site visit interviews of local experts (interviews, 2012: Bartholomew, Branson, Godfrey, Lake, McGrath and McCulley, Renquist). Additionally, information obtained for the *Washington Update, MSFW Enumeration Profiles Study* provided some rule of thumb factors from knowledgeable experts in that state (Gempler, 2008; Roy, 2008; Schreiber, 2008; Smith, 2008; Torrence, 2007; Waters, 2008)

2. Nursery/Greenhouse and Crops Grown Under Cover

a. General Methodology

Nursery/greenhouse workers and those employed in crops grown under cover involve many different categories. These include: bedding plants, cut flowers, florist greens, floriculture, flower seed crops, foliage plants, greenhouse vegetables, mushroom

production, potted flowering plants, sod and vegetable seed crops. Some products are grown in covered structures while others are raised in open acreage. Tasks differ with product type and production needs.

b. Data Sources/Calculations

Two sources of worker figures were located to provide information on nursery/greenhouse employees.

- OR UI Database average for 2007-2011 for workers employed in NAICS 1114 for three quarters or less annually. This source provided county-level figures (OED, 2012).
- *Oregon Nursery and Greenhouse Survey* (OR NASS, 2010) statewide estimate of the number of “seasonal” nursery/greenhouse workers for Oregon, as noted in OR NASS surveys conducted in 2005, 2007, and 2009. An average of these survey figures was utilized to represent the statewide worker number. This figure was then proportionally allocated based on the county share of the total nursery/greenhouse workers (NAICS 1114) noted by the first data source (OR UI Database five year average).

The final county-level estimates were derived by averaging the results of these two methods.

3. Christmas Trees

a. General Methodology

MSFWs are employed in various tasks in the production of Christmas trees. Two means were found to estimate these workers.

b. Data Sources/Calculations

The first method used the DFL formula approach with factors found to estimate the number of jobs in this industry, similar to the process noted for field agriculture.

The second source involved a special study detailed in the *2010-2011 Oregon Agriculture and Fisheries Statistics*, Table 34 “Christmas trees: workers and wages, by size of operation” (USDA, 2011). Information was available and averaged from worker surveys conducted in 2005, 2007, 2008 and 2010. Similar to the method used to derive the nursery/greenhouse estimates, the resulting statewide seasonal Christmas tree worker figure was allocated per county based on the proportionate share of the statewide total derived through the DFL estimation technique. The final county-level estimates were an average of figures obtained from the two methods.

4. Food Processing

a. General Methodology

As noted earlier, food processing encompasses a very broad category ranging from field sorting and packing to year-around operations that continually transfer, pack and ship produce in a changed form; e.g., juiced. Other state-level reports in the MSFW Enumeration Profiles Study series used a variety of methods to estimate the number of temporary workers involved.

Different methods were investigated and discussions held with numerous commodity experts to determine a reasonable method to produce such estimates. One method that was tried involved listing all Oregon licensed food processors and dividing this large group into subcategories, ruling out facilities which, from their name or other available information, appeared to be solely operations which changed the form of the commodity; e.g., bakeries. This list was then shared with experts in an effort to obtain their best estimates of seasonal workers who might be employed at the remaining establishments.

The OR UI Database figures for workers by NAICS were also examined, although this presented difficulties. Those classified under NAICS 115114, post-harvest activities, were minimal, and workers under the food processing manufacturing code 3114 had to be excluded in light of December 2012 changes in the migrant health definition of MSFWs (see discussion in C. “Definitions” section).

b. Data Sources/Calculations

In the end, it was determined that the best method would be to incorporate post-harvest activities (such as sorting, topping, cleaning, grading, and packing for fresh market) into DFL task estimates. For specific commodities where the necessary factors could not be found; e.g., onions and potatoes; knowledgeable experts were contacted and asked to assist by providing rule-of-thumb methods (e.g. Charlton, 2013, Horneck, 2013). Field agriculture estimates for the following crops included some post-harvest/food processing activities: blueberries, broccoli, carrots, cucumbers, hazelnuts, onions, peppers, potatoes and sweet corn. For other crops, some harvest calculations may also have included post-harvest tasks (such as cleaning and sorting).

5. Reforestation

a. General Methodology

Reforestation activity is different from work in the other industry classifications as stands of trees are left to grow from five to forty-five years or longer. This means only a proportion of timberland in a state is engaged by tree planters each year. As the exact

location of this labor differs annually, a worker estimate can only be provided on a statewide basis.

Four methods were employed to estimate reforestation workers. Two used worker numbers while the other two encompassed a formula approach. Two additional methodologies were examined but discarded as the results were considerably lower than the findings from the other methods. An average from the results of each of these four methods was used for the estimate of statewide reforestation workers.

b. Data Sources/Calculations

Method One: The Oregon Labor Management Information System (OLMIS) lists all employers under NAICS 1153 (support activities for forestry) (OED, 2013). The source provides a minimum and maximum range for number of worker per employer. This includes businesses which perform other activities besides tree planting. The list was examined and those with “reforestation” as part of their business name were pulled out. Additionally, those classified by OED under industry activity as “forest” or “forester” were also included as they appeared to be indicators of tree planting. The mid-point of the employee range for each of these businesses was calculated.

Method Two: OED worker numbers for those employed three quarters or less annually (averaged over a five-year period) under NAICS 1153 were used. Because this number is not exclusive to tree planters, it was necessary to reduce the figure for those not involved in this activity. The percent of businesses in NAICS 1153 employed in reforestation, as calculated from the OLMIS database used in Method One, was applied to derive a figure for Method Two.

Method Three: A DFL approach was utilized for the third method, obtaining factors from a variety of sources. No figure could be found for the acreage or number of trees planted in Oregon for the last five years. An article by Brian Rooney, OED, “Oregon’s Forestry and Logging Industry: from Planting to Harvest” (Rooney, 2012) quoted an Oregon Forest Resources Institute statement that “about 40 million trees are planted in Oregon each year.” A publication by this source, “Does Oregon Law Require Reforestation?” states “foresters typically plant 400 seedlings per acre,” which allowed for a calculation of approximately 100,000 reforested acres annually.

Verification of this figure was gained with the assistance of Mr. Rooney who referenced a 2011 figure of 31,813 harvested acres for government land. Similar information was not available for harvested private lands. He noted the State of Oregon requires all harvested land to be replanted, which, if 31,813 acres were subtracted from the 100,000 replanted annually, would mean there were 68,187 private acres harvested and replanted. Mr. Rooney felt this was about the correct figure for private acreage, and backed into estimates in this way, he thought the estimate of 100,000 acres replanted annually was reasonable (email: 2013).

Work hours for reforestation were generally agreed to be eight per day, very close to the 8.09 hours/day in field work. Hours for task to plant fir, cedar, hemlock and other similar trees grown in Oregon is 3.8, calculated at an average 2.105 acres per day planted per worker in an 8 hour day (Sargent, 2000). Season length averages 22.14 days, calculated on a 45 day peak season working (40 hours per week minus 10 days for weather-related reasons) (Sargent, 2000).

Method Four: A rule-of-thumb offered by Monte Bell of the U.S. Forest Service (Bell, telephone conversation, 2002) suggested one worker takes one day to replant an acre of land, with a season length of 22.14 days (as noted above). This calculation composed the fourth estimation method.

6. Specialty Forest Products Gatherers

a. General Methodology

Oregon has always had individuals who work in the woods gathering and selling or using non-timber forest products including ferns, salal, wreaths, mushrooms, medicinal herbs and other items. Much of this is incorporated by the floral industry or for other value-added production. Workers are also employed in using these gathered items to make Christmas wreaths.

b. Data Sources/Calculations

OR UI Database numbers were examined for NAICS 11321 (forest gathering) for those working three or fewer quarters annually, averaged for a five year period. This statewide figure was utilized in the Report.

7. Duplication Rate

a. General Methodology

The DFL and rule of thumb methods used for field agriculture estimate “FTE jobs” not workers. An adjustment was made to account for those employed in more than one agricultural “FTE job.” For example, a single individual might work in both cherry and pear operations or he/she might work in both pruning and harvesting tasks within grape production. If the estimates for workers employed in single crops or tasks were simply added, the results would overestimate the number of individuals employed. The same could be true of those working in the other agricultural industries estimated in this study: nursery/greenhouse, food processing, reforestation and forest gathering. Consideration was given to whether there was a different duplication rate within each of these industries.

The best way to develop such a factor is to look at actual employment work history. There is not a lot of data from which to develop this information; however two sources specific to Oregon were located which noted jobs held by clients qualifying for services under the National Farmworker Jobs Program administered by the Oregon Human Development Corporation (2013), and the OR UI Database looking at workers employed three quarters or less over an average of five years. The first source offered a large database for field/crop work but did not have sufficient numbers to be of use in calculating a duplication rate for the other agricultural industries. The second source could be examined by number of employers and number of workers for each separate NAICS coded industry included in this study.

b. Data Sources/Calculations

Field Agriculture: Oregon Human Development Corporation work history information provided a sufficiently large database to calculate a jobs/worker duplication rate for field agriculture. Similar to DFL calculations, this included postharvest jobs such as topping, sorting, grading and packing. This rate, 2.068 jobs per worker was greater than that used in the original 2002 Oregon MSFW EPS report and corresponded to a sense of more jobs performed by a single worker then was true ten years ago as was noted by survey respondents and interview subjects (interviews, 2012: Bartholomew, Branson, Godfrey, Northwest Research and Extension Center, Nuestra Comunidad Sana, Ramirez, Yasui).

Other Agricultural Industries: The OR UI Database was used to determine duplication rates for workers in the other agricultural industries.

The results for all agricultural industries in the study are provided below:

Duplication Rates

Coverage	Category	Rate
State	Field Agriculture	2.068
State	Reforestation	1.148
State	Forest Gathering	1.000
State	Nursery/Greenhouse	1.057

8. Sub-Group Estimates

a. General Methodology

Sub-groups estimated for the study are migrant farmworkers, seasonal farmworkers, non-farmworker family members accompanying farmworkers, and children and youth in specified age groups. Migrant farmworkers include both individuals who meet the

definition of a migrant but only travel within the State of Oregon (intrastate migrants) and others who come from outside the state to work in Oregon (interstate migrants).

Both “non-farmworkers” and “children and youth” are estimated but contain overlapping individuals. The first group includes anyone of any age in the household who is not employed in farm work. The latter group covers anyone in the household from ages less than one through nineteen. Although the category “children and youth” involves those of a young age who are non-farmworkers, it also includes youths who may be farmworkers. This is why the estimates for “non-farmworkers” and for “children and youth” are different.

Sub-group calculations were made, at a county level, as follows:

- Apply the percent identified as migrant workers and the percent identified as seasonal workers to estimates for all MSFWs.
- Determine the percent of each sub-group (migrant workers and seasonal workers) who are accompanied by non-farmworkers. This is as opposed to workers who represent single person households; for example, six unrelated men living in one household would be labeled as six single-person households.
- Divide the group of accompanied workers by the average number of farmworkers per household to determine the number of accompanied households.
- Multiply the number of accompanied households by the average of “other members per household” to derive the estimate for “non-farmworkers.”

The age groupings considered to be the most useful descriptors for the population who are identified as “children and youth” (given the needs of funding sources and health care programs) are: less than 1 year, 1-4 years, 5-12, 13-14, 15-18, and 19 years. Figures were found for the number of individuals in each accompanied household who are less than 20 years old. These were multiplied by the estimate of accompanied migrant and seasonal households to find total number of migrant and seasonal children and youth.

Twenty sources were identified that contained demographic information useful for calculation of factors necessary to estimate non-farmworkers in accompanied households. Many of these were client databases. All, with the exception of regional data provided by the U.S. Department of Labor, National Agricultural Workers Survey, were specific to Oregon. Included in this source list are the following (complete references are provided in the Bibliography):

- Clackamas Health Centers, patient database.
- Clinica del Valle, patient database.
- Columbia River Community Health Services, patient database.
- Community Health Centers of Benton and Linn Counties, patient database.
- Community Health Centers of Lane County, patient database.
- Community Health Centers, patient database.
- Julie Samples, Oregon Law Center, et. al., “Pesticide Exposure and Occupational Safety Training of Indigenous Farmworkers in Oregon.”

- La Clinica del Carino/One Community Health, patient database.
- Mosaic Medical, patient database.
- Multnomah County Health Clinics, patient database.
- Northwest Human Services, patient database.
- Oregon Child Development Coalition, enrollment summaries from three separate Head Start and Early Start Programs.
- Oregon Health Authority, WIC enrollment database.
- Oregon Human Development Corporation, client database.
- Oregon Office of Education, Migrant Education Program, enrollment database.
- Siskiyou Health Center, patient database.
- The Next Door, food drive statistics for Wasco and Hood River Counties.
- U.S. Department of Labor National Agricultural Workers Survey (NAWS), Public Access Data.
- Virginia Garcia Memorial Health Center, patient database.

Oregon patient database information was also available from the Yakima Valley Farmworkers Clinic. Although this was a large database, the resulting statistics were out of the range of the information offered by other sources and so were not included in calculations.

b. Sub-Group Estimate Factors

The discussion below pertaining to each subgroup indicates which of these sources provided information useful for developing the specific statewide factor. Table Three, “Percent Migrant, Percent Seasonal, Percent Accompanied and Accompanied Household Size Used in Oregon Update MSFW EPS Estimates” summarizes this information. Also included are factors used to make estimates for a few specific counties where additional information was available for what was felt to be a large sample of the county population sufficient in size to justify a factor that was different from the statewide average..

Migrant/Seasonal: Twelve sources reported the migrant percent and seasonal percent for MSFWs in Oregon. They included: Clackamas County Health Centers, Clinica del Valle, Columbia River Community Health, Community Health Centers, Community Health Centers of Benton and Linn Counties, Community Health Center of Lane County, La Clinica del Carino, La Clinica del Valle, Migrant Education Program, Mosaic Medical, Multnomah County Health Clinics, Northwest Human Services, and Virginia Garcia Memorial Health Center. The estimates ranged from 53.4% - 10.5% for migrants and 89.5%-46.6% for seasonals. Data from Mosaic Medical were excluded from calculations as the percent split was outside the range of the other estimates. The number of individuals reported by each source were noted and the sources weighted to equalize information.. The results found a statewide average of 33.5% migrants and 66.5% seasonals. This factor was used for all counties with the exception of Washington and Yamhill Counties as these areas had a database

sufficient to offer information on at least 500 individuals per year. A similar weighted process was applied to the percentages developed specific to these two counties.

Accompanied: Nine sources offered information on the percent of the MSFW work force who were accompanied, as opposed to solo workers traveling without family members. These were: Clackamas County Health Centers, Community Health Center of Lane County, La Clinica del Carino, Mosaic Medical, Multnomah County Health Clinics, NAWS, Northwest Human Services, Oregon Human Development Corporation, and Virginia Garcia Memorial Health Center. Information from the NAWS was not used as data were older and not Oregon-specific. The range for accompanied households noted by each source fell from 95.0% - 42.4%. A process similar to that used for migrant/seasonal percent calculations was applied. The statewide weighted average factor for both migrants and seasonals was determined to be 75.8% accompanied households. No data were available in a large enough volume to offer separate county estimates.

Farmworkers per Household: Only one source was found which contained information on the number of farmworkers per accompanied household: NAWS (2005-2009) which reported regional information encompassing eight states (Oregon and Washington were the dominant hand labor farmworker contributors). This survey offered the figure of 2.05 farmworkers per accompanied household for both migrant and seasonal farmworkers. Information received from CASA of Oregon related to small-scale housing needs assessment surveys verified this figure as a similar finding (telephone conversation: Hainley, 2013).

Non-Farmworkers per Household: Calculations for non-farmworkers per household began with determination of household size for accompanied workers. Data from twelve sources contributed information: Clackamas County Health Centers, Community Health Center of Lane County, La Clinica del Carino, Mosaic Medical, Multnomah County Health Clinics, Northwest Human Services, NAWS, Oregon Child Development Coalition (from three separate programs), Oregon Human Development Corporation, and Virginia Garcia Memorial Health Center. The NAWS data were excluded from calculations. The range of accompanied worker household size offered by these sources fell between 4.76 and 3.46. The weighted average was calculated to be 4.09 statewide household size for accompanied MSFWs. Two counties had a database over 500 households per year, providing information for calculations separate from the statewide average. Data for Washington and Yamhill Counties were weighted to determine county-specific household size factors.

The number of farmworkers per accompanied household (noted above) was subtracted from the MSFW accompanied household size to calculate non-farmworkers. The results found 2.04 non-farmworkers in accompanied MSFW households. There were different calculations made from the data for Washington and Yamhill Counties.

9. Children and Youth by Age Groups

“Children and youth,” as defined in the study, are those ages infant through 19. Whether or not these individuals perform farm work does not matter for estimation purposes. This means the group “non-farmworkers in MSFW households” and the group “children and youth” are not mutually exclusive.

Four sources offered information on the number of children and youth per MSFW household. These included: Multnomah County Health Clinics and the three programs of the Oregon Child Development Coalition. The Next Door also provided information, but it was specific to Hood River County and was not used to calculate a statewide factor. The resulting average found 2.40 children and youth per MSFW accompanied household (range 2.25 – 2.54). The same factor was found to be true whether the total number of households reported from each source were added or whether a weighted calculation was made. Sufficient information was not available to develop county-specific figures.

This factor was multiplied by the number of migrant and number of seasonal farmworker households calculated in the Final OR Update MSFW EPS to determine estimates for children and youth. The results found 25,149 migrant and 54,974 seasonal children and youth in Oregon.

Two sources provided age category breakdowns for MSFW children and youth: the Migrant Education Program and Multnomah County Health Clinics. The numbers reported by each source were weighted and the following percentages determined for all MSFW children and youth by age group.

<u>Age</u>	<u>MSFW</u>
Under 1	2.2%
Ages 1-4	17.9%
Ages 5-12	51.6%
Ages 13-14	10.4%
Ages 15-18	16.3%
Age 19	1.6%

10. Final Estimates

The final statewide estimate for all MSFW workers was determined to be 90,289. The estimate for MSFW workers and accompanying non-farmworkers was 160,429. These are broken down by county, as well as for migrant workers, seasonal workers and non-farmworkers in accompanied households in Table One, “Oregon Update MSFW Enumeration Profiles Estimates, Final.” Also included is a table of the estimated statewide numbers of children and youth in each age group for migrants and for seasonal.

Two Draft report reviewers requested a confidence interval be added to help explain the reliability of these resulting estimates. Such statistics are very difficult to derive given the wide range and variability among the data sources utilized for agricultural production jobs, duplication rates, and factors to derive non-farmworker household member numbers.

A source is available which might serve to suggest the lower end of such a confidence interval/range for a MSFW worker estimate: the OR UI Database number for a five-year average of workers employed in the separate NAICS codes examined in this study (OED, Oregon Unemployment Insurance Wage Database, 2012). As described earlier, this was derived from a special data run looking at the number of workers employed three quarters or less. Mary Lewis, who held the MSFW Monitor Advocate position at OED for a considerable period (currently Claimant Re-Employment Coordinator) and is familiar with both the MSFW population and the OR UI Database, describes this source as follows: “When I talk about our numbers, I talk about it as a floor” (Lewis, telephone conversation: 2013).

The resulting statewide five year average total from the OR UI Database was: 72,762 (82,764 if the food processing NAICS code 3114 is also included). This might be considered high for a bottom range figure as the data includes workers with multiple jobs/employers, meaning a single individual would be counted more than once. On the other side, as noted earlier, the number is low given the many reasons why workers might not be included in this database (see G.3.g. “Other Adjustments from Draft to Final”).

It is very difficult to determine what might be the upper threshold of a MSFW worker estimate confidence interval/range. No other statewide figure is known which could be described as a higher end estimate. For lack of any other source, the OR Update MSFW EPS statewide estimate without a duplication rate (a factor of 2.068 jobs per worker) applied might serve this purpose. Unduplicated, an upper confidence interval/range limit for a MSFW worker estimate might be: 170,755.

It is not possible to determine a confidence interval for the number of non-farmworkers in accompanied MSFW households as this estimate relies on several factors derived from a variety of diverse data sources. A very crude measurement could be derived based on the ratio of worker to non-farmworker developed for the OR Update MSFW EPS (.7768 non-farmworkers for every 1 worker). This would make the lower confidence interval for non-farmworkers 56,525 and upper confidence interval 132,651.

Adding confidence interval figures for workers plus non-farmworkers resulted in the following: lower – 129,287; upper – 303,406. When considering this range, it should be remembered that the lower limit is based on data known to exclude MSFWs who would be considered part of this study. The upper end of the range includes an assumption that each worker is only employed in one seasonal agricultural job.

TABLE ONE
OREGON UPDATE MSFW ENUMERATION PROFILES ESTIMATES
FINAL

FIELD AGRICULTURE, NURSERY/GREENHOUSE AND FOOD PROCESSING

County	MSFW Worker Estimates	Migrant Workers	Seasonal Workers	Non-Farmworkers In Migrant Households	Non-Farmworkers In Seasonal Households	Total MSFW Workers and Non-Farmworkers
Baker	583	195	387	147	292	1,022
Benton	1,840	616	1,223	465	923	3,227
Clackamas	7,031	2,355	4,675	1,777	3,527	12,334
Clatsop	412	138	274	104	207	722
Columbia	242	81	161	61	121	424
Coos	244	82	162	62	122	427
Crook	75	25	50	19	37	131
Curry	391	131	260	99	196	687
Deschutes	120	40	80	30	60	210
Douglas	1,470	492	978	371	737	2,579
Gilliam	48	16	32	12	24	84
Grant	55	18	37	14	28	96
Harney	35	12	23	9	18	62
Hood River	7,564	2,534	5,030	1,911	3,794	13,269
Jackson	4,942	1,656	3,286	1,249	2,479	8,670
Jefferson	471	158	313	119	236	826
Josephine	622	208	413	157	312	1,090
Klamath	881	295	586	223	442	1,545
Lake	98	33	65	25	49	171
Lane	2,122	711	1,411	536	1,065	3,723
Lincoln	206	69	137	52	103	361
Linn	1,699	569	1,130	429	852	2,981
Malheur	5,981	2,003	3,977	1,511	3,000	10,492
Marion	13,118	4,394	8,723	3,315	6,580	23,013
Morrow	3,459	1,159	2,300	874	1,735	6,068
Multnomah	1,700	570	1,131	430	853	2,983
Polk	4,782	1,602	3,180	1,208	2,399	8,388
Sherman	57	19	38	14	28	99
Tillamook	35	12	23	9	18	61
Umatilla	5,623	1,884	3,739	1,421	2,821	9,864
Union	439	147	292	111	220	771
Wallowa	69	23	46	18	35	122
Wasco	5,674	1,901	3,773	1,434	2,846	9,954
Washington	6,722	1,351	5,371	1,134	4,508	12,364
Wheeler	6	2	4	1	3	10
Yamhill	8,245	1,756	6,489	1,636	6,046	15,928
Total State	87,057	27,257	59,800	20,987	46,715	154,759
Reforestation	3,023	1,013	2,010	764	1,516	5,303
Forest Gatherers	209	70	139	53	105	367
Grand State Total	90,289	28,340	61,949	21,804	48,337	160,429

Table One. Oregon Update MSFW Enumeration Profiles Estimates (page two)

NOTES FOR ESTIMATES TABLE

County numbers have been rounded and, therefore, may not exactly add to totals.
 Excluded from these estimates are those who work with livestock or poultry, in dairies or fisheries, perform ranching activities, operate farming equipment or drive trucks to transport agricultural products.

CHILDREN AND YOUTH BY AGE GROUPS (STATEWIDE)

Age Groups	Migrant Percent	Number of Migrant Children And Youth	Seasonal Percent	Number of Seasonal Children And Youth
< 1	2.2%	553	2.2%	1,209
1-4	17.9%	4,502	17.9%	9,840
5-12	51.6%	12,977	51.6%	28,367
13-14	10.4%	2,616	10.4%	5,717
15-18	16.3%	4,099	16.3%	8,961
19	1.6%	402	1.6%	880
Total	100.0%	25,149	100.0%	54,974

NOTE: "Children and Youth" are defined as those under 20 years of age. Some may be farmworkers

TABLE TWO
OREGON UPDATE FIELD AGRICULTURE METHODS
DEMAND FOR LABOR FACTORS AND RULE-OF-THUMB
FINAL

Crop	Task	Hours For Task	Peak Season Length (Work Days)	Method Notes	General Notes
Apples	harvest	187.38	30.48		
	prune/thin	47.92	35.00		
Apricots	harvest	96.00	16.43	Average two methods	
		1 worker/acre			
Asparagus	harvest	59.59	28.57	Average two methods	
		3 worker/acre			
Beans - lima green/dry	preharvest	10.65	5.71		
Beans - green/snap	grade/clean/box/storage	35.95	32.86		
Beets	harvest	29.02	43.57		
	prune/tie/train	162.93	21.43		
Blackberries	harvest	137.30	48.57	No estimate for Clackamas and Marion Counties as machine harvested	
	prune/thin/train	162.93	21.43		
Blueberries	harvest	648.00	51.00	Average two methods	Fresh acres
		.25 workers/acre			
	prune	60.00	21.43	Add two methods	Fresh harvest
		48.00	21.43		Machine harvest
	process/pack	140.00	51.00	Average two methods	Fresh acres
.05 worker/acre					
weed	65	8.13		Organic acres in Clackamas Co	
Boysenberries	harvest	76.50	15.00		
	prune/tie	57.50	21.43		
Broccoli	harvest/pack	101.44	43.57		
Cabbage - Chinese and Head	harvest	114.69	38.57		
Cantaloups	harvest	73.42	23.90		
Carrots	wash/grade/size/pack	7.88	21.43		
Cauliflower	harvest	87.00	44.29		
Celery	harvest	125.70	10.71		
Cherries - Sweet	harvest	28.66	10.00	Average five methods	
		185.63	43.57		
		2.5 workers/acre			
		.8 workers/acre			
	.33 workers/acre				
prune	44.75	52.86			
Cherries - Tart	preharvest	13.00	6.67		

Field Agriculture Estimation Methods - Continued

Crop	Task	Hours For Task	Peak Season Length (Work Days)	Method Notes	General Notes
Chestnuts	all activities	45.00	17.86		
Christmas Trees	all activities	31.70	21.43	Average two methods	Source: Oregon Department of Agriculture, 2011
	worker numbers	Average seasonal workers -- statewide figure allocated to counties			
Cranberries	harvest-dry	24.00	12.50	Add two methods	70% dry acres
	harvest-wet	12.00	12.50		30% wet acres - Coos County only wet acres
Cucumbers/Pickles	harvest	105.72	47.86		
	grade/pack	53.88	47.86		
Currants	harvest	75.00	13.57		
Garlic	plant/pre-harvest	18.00	21.43		
	harvest	115.73	87.86		
Grapes - Wine	harvest	3.85	17.14	Average two methods	Mechanically harvested acres (87.5%)
		200.83	17.14		Hand harvested acres (12.5%)
		5 workers/acre		Add mechanically harvested and average hand harvested	General harvest
		Mechanical and hand harvest			
		1.74 workers/acre			
		2 workers/acre			
		1.5 workers/acre			
	Overall harvest		Average results: mechanically + hand harvested and three general harvest methods		
	prune/thin	.3 workers/acre		Average four methods	
		1/3rd of final harvest workers estimate			
.1375 workers/acre					
59.15	39.00				
process	.0667 workers/acre				
Hazelnuts	all activities	1.46	7.86		
Herbs	harvest	293.00	33.57		
Hops	harvest	.0567 workers/acre			
	tie/train	15.43	18.40		
Kiwifruit	harvest	175.00	155.00		
Lettuce	harvest	109.60	59.29		
Loganberries	harvest	137.30	48.57		
Mint	prune/weed	4.00	31.00		
Nectarines	harvest	38.00	30.00		

Field Agriculture Estimation Methods - Continued

Crop	Task	Hours For Task	Peak Season Length (Work Days)	Method Notes	General Notes
Onions	weed	100.00	21.43	Average two methods	Fresh acres
		82.94	21.43		
	sort/pack	.25 workers/acre		Add process and fresh	Process acres Fresh acres
		.50 workers/acre			
Peaches	harvest	87.59	32.86	Average two methods	
		1 worker/acre			
Pears - Bartlett	harvest	68.57	18.20	Average two methods	
		5 workers/acre/day			
	prune/thin	46.80	35.00		
Pears - Bosc and others	harvest	72.57	15.00	Average two methods	
		1.6 workers/acre			
	prune/thin	36.07	41.43		
Peppers - all types	harvest	176.09	57.00		
	grade/pack	156.08	57.00		
Plums	harvest	34.00	16.19		
Potatoes	general labor	5.22	54.29		Hours for Task for Klamath Co = 13.00
	sort/pack	.20 workers/acre			
Pumpkins	harvest	46.00	53.00		
Radishes	harvest	105.00	32.00		
Raspberries	harvest	76.50	18.57	No estimate for Clackamas, Multnomah and Washington Counties as machine harvested	
	prune	40.00	22.00		
Rhubarb	harvest	120.00	15.71		
Spinach	harvest	150.00	9.29		
Squash - summer	harvest	83.79	30.00		
Squash - winter	harvest	82.46	30.00		
Strawberries	harvest	465.47	40.77		
Sugar beets	preharvest	5.91	21.42		
Sweet corn	harvest	44.21	31.07		Fresh acres
	pack	.175 workers/acre			
Sweet corn - seed	detassle	71.6 acres/worker			
Tomatoes	harvest	166.67	32.69		
Turnips	harvest	178.50	77.15		
Walnuts	harvest	80.00	22.86	No estimate for Washington Co as machine harvested	
Watermelon	harvest	78.01	28.54		
Other berries	harvest	246.46	31.25	Average factors for all berries	
Other crops	prune/tie/weed	10.55	23.67	Average factors for all classified as "other crops"	

NOTES:

Daily Work Hours (the last Demand for Labor factor) = 8.09 for all tasks.

TABLE THREE
PERCENT MIGRANT, PERCENT SEASONAL
PERCENT ACCOMPANIED AND ACCOMPANIED HOUSEHOLD SIZE
USED IN OREGON UPDATE MSFW EPS ESTIMATES

[STATEWIDE FACTOR USED UNLESS COUNTY SPECIFIC DATA PROVIDED]

FINAL

State/County	Migrant Percent	Seasonal Percent
<i>Statewide</i>	33.5%	66.5%
Washington Co	20.1%	79.9%
Yamhill Co	21.3%	78.7%

State/County	Migrant Accompanied Household Percent	Seasonal Accompanied Household Percent
<i>Statewide</i>	75.8%	75.8%

State/County	Migrant Average Accompanied Household Size	Seasonal Average Accompanied Household Size
<i>Statewide</i>	4.09	4.09
Washington Co	4.32	4.32
Yamhill Co	4.57	4.57

TABLE 4
STATEWIDE OREGON JUDICIAL DEPARTMENT INDIGENOUS LANGUAGE REQUESTS
CALENDAR YEAR 2011

COUNTY	AKATEKO	MAM	MAYA	MIXTECO	MIXTECO BAJO	NAHUATL	Q'ANJOBAL	TARASCO (PUREPECHA)	TLAPANECO	TRIQUE	TZOTZIL CHIAPAS	ZAPOTECO	COUNTY TOTAL
Clatsop									2				2
Jackson					4								4
Jefferson									1				1
Lincoln	1	2				1							4
Malheur			3							1			4
Marion		3		6							1	1	11
Multnomah	2		4				4			6			16
Polk										1			1
Umatilla								2		2			4
Washington	5			4			2			1			12
TOTAL LANGUAGE	8	5	7	10	4	1	6	2	3	11	1	1	59

CALENDAR YEAR 2012

COUNTY	AKATEKO	CHUJ	IXL	MAM	MAYA	MIXTECO	MIXTECO BAJO	MIXTECO ALTO	NAHUATL	Q'ANJO BAL	QUICHE	TARASCO (PUREPECHA)	TRIQUE	TZOTZIL CHIAPAS	ZAPO- TECO	COUNTY TOTAL
Linn						1										1
Malheur						1										1
Marion				8		5	3	1				2		4	2	25
Multnomah	11				1	2	1	2	2	4	1	9	4			37
Umatilla												3				3
Washington	17	2	1			1	5			2	1					29
TOTAL LANGUAGE	28	2	1	8	1	10	9	3	2	6	2	14	4	4	2	96

BIBLIOGRAPHY

- Bartholomew, Leigh, Vineyard Manager, Archery Summit Winery, interview: Dayton, OR, September 11, 2012.
- Bell, Monte, U.S. Forest Service – Oregon, Contracting, Portland, OR, telephone conversation: September 10, 2002.
- Branson, Dana, Sweet Cherry Commission, and Megan Thompson, Oregon Cherry Growers Inc., interview: Hood River, OR, September 18, 2012.
- Charlton, Brian, Cropping System Specialist, Klamath Basin Research and Education Center, Oregon State University, telephone conversation: February 12, 2013.
- Clackamas Health Centers, Patient Database, 2008-2012, received March, 2013.
- Clemson University, Coastal Research and Applied Economics, Crop Budgets (various), 2011-2012.
- Clinica del Valle, Patient Database, 2008-March 2013, received March, 2013.
- Coffman, Diane, Oregon State University, Northwest Willamette Research and Extension Center, telephone conversation: September 17, 2002.
- Columbia River Community Health Services, Patient Database, 2011-2012, received March, 2013.
- Community Health Center, Patient Database, 2009-2012, received March, 2013.
- Community Health Centers of Benton and Linn Counties, Patient Database, 2008-2012, received February, 2013.
- Community Health Centers of Lane County, Patient Database, 2008-2012, received March, 2013.
- Crollard, Andrew, Oregon Employment Department, “Manufacturing in Rural Oregon,” 2011.
- Cruz, Rolando, Office of Multicultural Health Services, *Oregon Migrant and Seasonal Farmworker Health Status*,” Portland, 2011.
- Dale, Michael, Northwest Workers Justice Project, telephone conversation: April 26, 2013.
- Dodson, Donald, Director, Oregon Child Development Coalition, interview: Wilsonville, OR, September 11, 2012.
- Donlan, William and Junghee Lee, “Indigenous and Mestizo Mexican Migrant Farmworkers: A comparative Mental Health Analysis,” *Journal of Rural Community Psychology*, Vol E13, No1.
- Eagan, Carolyn, Oregon Employment Department, “Urban Oregon Dominates the State’s Manufacturing Employment,” 2011.
- EMSI, “The Southern Oregon Wine Cluster,” Moscow, ID, 2011.
- Farquhar, Stephanie, et. al, “Occupational Conditions and Well-Being of Indigenous Farmworkers,” *American Journal of Public Health*, 2008, 98: 1956-1959.
- Fernow, Jonathan, Oregon Migrant Education Program, email: April 24, 2013.
- Fridley, Dallas, Oregon Employment Department, “Recovery Remains Elusive for Key Manufacturing Industries in the Mostly Rural TOC/OWA Region,” 2012.
- Fridley, Dallas, Regional Economist, Oregon Employment Department, email: December 18, 2012.

Fridley, Dallas, Regional Economist, Oregon Employment Department, email: February 13, 2013.

Fridley, Dallas, Regional Economist, Oregon Employment Department, telephone conversation: February 11, 2013.

Full Glass Research, "The Economic Impact of the Wine and Wine Grape Industries on the Oregon Economy," Davis, CA, 2011.

Gempler, Mike, Washington Growers League, interviews: Yakima, WA, August 15 and October 6, 2008; e-mail: November 24, 2008.

Godfrey, Jean, Director, Columbia Gorge Fruit Growers, interview: Hood River, OR, September 17, 2012.

Guild, Alexis, Farmworker Justice, "Indigenous Farmworkers Face Unique Barriers to Healthcare," Washington, D.C., 2012.

Gutierrez, Fernando, Oregon Employment Department, Monitor Advocate, email: April 22, 2013.

Gutierrez, Fernando, Oregon Employment Department, Monitor Advocate, telephone conversation: February 11, 2013.

Hainley, Peter, CASA of Oregon, telephone conversation: April 19, 2013.

Horneck, Don, Crop Specialist, Hermiston Agricultural Research and Education Center, Oregon State University, telephone conversation: February 11, 2013.

Knoder, Erik, Oregon Employment Department, "Employment Forecasts for Region 1," 2011.

Knoder, Erik, Oregon Employment Department, "Employment Forecasts for Region 4," 2011.

Kraal, Martin, Oregon Employment Department, "Hispanic Employment in Marion, Polk, and Yamhill Counties," 2013.

La Clinica del Carino/One Community Health, Patient Database, December 2011-March 2013, received March 2013.

Lake, Chris, Director, Southern Wine Institute, Umpqua Community College, interview: Roseburg, OR, September 14, 2012.

Larson, Alice C., *Oregon Migrant and Seasonal Farmworkers Enumeration Profiles Study*, Vashon Island, WA, 2002

Larson, Alice C., *Washington Update Migrant and Seasonal Farmworker Enumeration Profiles Study Final Report* (unpublished report prepared for the Washington Association of Community and Migrant Health Centers), Vashon Island, WA, 2009.

Lewis, Mary, Oregon Employment Department, email: May 2, 2013.

Lewis, Mary, Oregon Employment Department, telephone conversation: April 25, 2013.

Mayer, Kirk, Washington Growers Clearing House Association, e-mail: October 3, 2008.

McGrath, Dan (Linn County Extension) and John McCulley (Professional Administrative Services), interview: Salem, OR, September 14, 2012.

Mertz, Chris, Director, Portland Field Office, National Agricultural Statistics Service, USDA, interview: Portland, OR, September 11.

Migrant Research Advisory Council Meeting, group interview: Maria Castro, Donalda Dodson, Stuart Cowburns, Marc Overbeck, Carol Cheney, Martin Campos, Claudia Maria Vargas, and Phil Cooper; Portland, OR, September 12, 2012.

Mines, Richard; Sandra Nichols and David Runsten, *California's Indigenous Farmworkers*, 2010.

Moreno, Alberto, Director, Latino Health Coalition; September 12, 2012, Portland, OR. Mosaic Medical, Patient Database, 2008-2012, received February, 2013.

MSFW Serving Families Committee meeting, group interview: Jonathan Fernow, Ron Hauge, Beto Espindola, Maria Castro, Maria Carmen Lopez, Amas Aduviri, Tim Blackburn, Marc Overbeck, and Antonio Ramos; Salem, OR, September 13, 2013.

Multnomah County Health Department , Patient Database, 2008-2012, received February, 2013.

National Center for Farmworker Health, "Indigenous Farmworkers," Buda, Texas, 2011.

Northwest Human Services, Patient Database, 2008-2012, received February, 2013.

Northwest Research and Education Center, Oregon State University, group interview: Mike Bondi, Lucia Santamaria, Robin Rosetta, Chal Langren, Nick Andrews, Bernidine Strik, Bob Reynolds, and Tom Silverstein; Aurora, OR, September 11, 2012.

Nuestra Comunidad Sana group interview: Lorena Sprager and Maria Antonia Sanchez, Janet Hamada, Executive Director, The Next Door; Hood River, OR, September 18, 2012.

Nutrition and Health Screening Program, Oregon Health Authority, WIC Enrollment Database, 2008-2012, received November, 2012.

O'Connor, Pat, Oregon Employment Department, "Oregon's Food Manufacturing Sector: Steady Over Time," 2010.

O'Connor, Pat, Oregon Employment Department, "Oregon's Nursery Industry: A History of Growth Before the Great Recession," 2012.

O'Connor, Pat, Oregon Employment Department, "Yamhill County's Diverse Manufacturing Sector," 2010.

OCHIN group interview: Steward Cowburns and Vance Bauer, OCHIN; John Heinzman, OHSU; Portland, OR, September 20, 2012.

Office of Employment Development, OED, group interview: Fernando Gutierrez, Monitor Advocate, and Daniel Quinones, MSFW Representative; Salem, OR, September 20, 2012.

Oklahoma State University Extension, Crop Budgets (various), 2012.

Oregon Board of Agriculture, "State of Oregon Agriculture," Salem, OR, 2012.

Oregon Child Development Coalition, *Community Assessment Summary 2010*, Wilsonville, 2011.

Oregon Child Development Coalition, *Community Assessment, 2009*, Wilsonville, 2010.

Oregon Child Development Coalition, Head Start and Early Start Enrollment Database Summaries, 2011-2012, received October, 2012.

Oregon Department of Agriculture, Food Safety Division, "Licensed Food Processors," pulled from website August, 13, 2012.

Oregon Department of Agriculture, *Oregon Agripedia*, 2011 Edition, Salem, 2011.

Oregon Employment Department, "Licensed Labor Camp List," pulled from website 2012.

Oregon Employment Department, "MSFW Equity Indicators Report," 2011, 2012 (obtained through Fernando Gutierrez, State Monitor Advocate, email: December 12, 2012).

Oregon Employment Department, "Oregon Agricultural Employment Estimates," Salem, 2008, 2009, 2010, 2011, 2012.

Oregon Employment Department, Oregon Labor Management Information System Employer Database, information pulled January 18, 2013.

Oregon Employment Department, Oregon Unemployment Insurance Wage Database, "Special Data Run of Workers and Employers by Specific NAICS," 2012.

Oregon Employment Department, WorkSource, "Agricultural Outreach Plan: Employment Services for Oregon's Farmworkers and Agricultural Employers," Salem, OR, 2012.

Oregon Forest Resources Institute, "Does Oregon Law Require Reforestation?" website publication.

Oregon Human Development Corporation, Client Database July 2010-2012, received January, 2013.

Oregon Judicial Department, "Statewide OJD Indigenous Language Requests for Calendar Year 2011," and "Calendar Year 2012," September, 2012, January, 2013

Oregon Law Center group interview: Nargess Shadbeh and Julie Samples, Oregon Law Center; and Laurie Hoefler, Legal Aid Services of Oregon; Hillsboro, OR, September 19, 2012.

Oregon Office of Education, Migrant Education Service Center, Migrant Education Enrollment Database, 2010-11 School Year, received August, 2012.

Oregon Primary Care Association group interview: Claire Tranchese and Howard Balschem, Portland, OR, September 19, 2012.

Oregon State University "Oregon Forest Industry Directory," pulled from website November, 2012.

Oregon State University, "Blueberry Economics: Establishing and Producing Blueberries in the Willamette Valley Region," EM 8526, Corvallis, OR, 2005.

Oregon State University, "Enterprise Budget, Apples, Medium Density, North Central Region," EM 8821, Corvallis, OR, 2007.

Oregon State University, "Enterprise Budget, Carrots, North Central Region," Corvallis, OR, 1991.

Oregon State University, "Enterprise Budget, Cherries, Sweet, Fresh Market, Standard Density, North Central Region," EM 8483, Corvallis, OR, 2008.

Oregon State University, "Enterprise Budget, Cherries, Sweet, Fresh Market, High Density, North Central Region," EM 8816, Corvallis, OR, 2008.

Oregon State University, "Enterprise Budget, Leaf Lettuce, Conventional, Fresh Market, Willamette Valley Region," EM 8932, Corvallis, OR, 2007.

Oregon State University, "Enterprise Budget, Pears, Bartlett, Fresh Market, North Central Region," EM 8484, Corvallis, OR, 2007.

Oregon State University, "Enterprise Budget, Pears, Medium Density, North Central Region," EM 8486, Corvallis, OR, 2007.

Oregon State University, "Enterprise Budget, Pears, Winter, North Central Region," EM 8485, Corvallis, OR, 2007.

Oregon State University, "Enterprise Budget, Radishes, Conventional, Fresh Market, Willamette Valley Region," EM 8930, Corvallis, OR, 2007.

Oregon State University, "Enterprise Budget, Spinach, Conventional, Fresh Market, Willamette Valley Region," EM 8928, Corvallis, OR, 2007.

Oregon State University, "Enterprise Budget, Wine Grapes, North Central Region," EM8942-E, Corvallis, OR 2007.

Oregon State University, Northwest Berry and Grape Information Network, "Mechanical Harvesting of Blueberry," 2006. <http://berrygrape.oregonstate.edu/mechanical-harvesting-of-blueberry/>

Pelter, Gary, and Erik Sorensen, Washington State University Extension, "Crop Profile for Onions in Washington," Ephrata, WA, Pasco, WA, 2003. www.ipmcenters.org/cropprofiles/docs/WAonions.html

Peniston, Barbara, Workforce and Economic Research, Oregon Employment Department, email communications October – December, 2012.

Primary Care Team meeting, Office for Health Policy and Research, Oregon Health Authority, group meeting: Oliver Dropper, Janet Johnson, Meadow Martel, Satenik Hackenbruck, Marc Overbeck, and Maria Chavez: September 12, 2012, Salem, OR.

Ramirez, Ramon, Director, PCUN, interview: Woodburn, OR, September 18, 2012.

Ramos, Antonio, Director, Migrant Education Service Center, Migrant Education Program, interview: Salem, OR, September 13, 2013.

Renquist, Steve, Horticulture/County Leader/Extension Agent, Oregon State University, Douglas County Extension, interview: Roseburg, OR, September 14, 2012.

Rippy, Raini, Forestry and Small Farms, Oregon State University, Douglas County Extension, interview: Roseburg, OR, September 14, 2012.

Rooney, Brian, Oregon Employment Department, "Long-term Industry Forecasts for Lane County," 2012.

Rooney, Brian, Oregon Employment Department, "Oregon's Forestry and Logging Industry: From Planting to Harvest," 2012.

Rooney, Brian, Oregon Employment Department, email: January 25, 2013.

Roy, Benton, Oasis Farms, Washington Association of Wine Grape Growers, interview: Prosser, WA, October 8, 2008.

Samples, Julie, et. al, "Pesticide Exposure and Occupational Safety Training of Indigenous Farmworkers in Oregon," *American Journal of Public Health*, 2009, 99: 581-584.

Sanchez, Valentin, Oregon Law Center Farmworker Program, "Indigenous Farmworkers Lead the Way in Addressing Occupational Health and Safety: The Role of Community Advisory Committees," a presentation to the Northwest Environmental Health Conference, Portland, OR, 2012.

Sargent, Bud, Forest Practices Division, Washington Department of Natural Resources, Chehalis, WA, telephone conversation: July 5, 2000.

Schick, Anthony, "Farmers Blame Tight Immigration for Labor Shortage in Fields," *The Oregonian*, August 24, 2012.

Schreiber, Alan, Washington State Asparagus Commission, Washington State Blueberry Commission, interview: Eltopia, WA, October 7, 2008; e-mails: October 14, 2008 and August 9, 2009.

Searl, Brent, Policy Analyst/Economist (retired January, 2013), telephone conversation: September 25, 2012.

Shadbeh, Nargess, Oregon Law Center, email: May 6, 2013.

Siskiyou Health Center, Patient Database, received February, 2013.

- Smith, Tim, Chelan County Extension, WSU, telephone conversation: September 30, 2008; interview: Wenatchee, WA, October 8, 2008; e-mails: November 24 and 25, 2008, August 17, 2009.
- Stephen, Lynn, *Globalization, the State, and the Creation of Flexible Indigenous Workers: Mixtec Farmworkers in Oregon*, University of Oregon, 2001.
- Tauer, Guy, Oregon Employment Department, "Oregon's Organic Agriculture and Food Processing Industry," 2010.
- The Next Door, Statistics from Food Drive in Wasco and Hood River Counties, 2012, received October, 2012.
- Torrence, Reid, Area Onion Agent, Tattall County CEC, Georgia; e-mail communication: October 24, 2007.
- U.S. Department of Agriculture, National Agricultural Statistics Service, "Farm Labor Report," 2008-2012, Washington, D.C.
- U.S. Department of Agriculture, National Agricultural Statistics Service, Datalab (Robert Hunt), "Special Tabulation Request – Hired Labor from the 2007 Census of Agriculture," 2012.
- U.S. Department of Agriculture, National Agricultural Statistics Service, Oregon Field Office, *2010 Oregon Nursery and Greenhouse Survey*, Portland, OR, 2011
- U.S. Department of Agriculture, National Agricultural Statistics Service, Oregon Field Office, *2010 Oregon Vineyard and Winery Report*, Portland, OR, 2011
- U.S. Department of Agriculture, National Agricultural Statistics Service, Oregon Field Office, *Oregon Christmas Trees*, Portland, OR, 2011
- U.S. Department of Agriculture, National Agricultural Statistics Service, Oregon Field Office, *2010-2011 Oregon Agriculture & Fisheries Statistics*, Portland, OR, 2011
- U.S. Department of Agriculture, National Agricultural Statistics Service, Washington Field Office, "Washington Fruit Survey Highlights," Olympia, WA, 2006.
- U.S. Department of Agriculture, National Agricultural Statistics Service, Washington Field Office, "Grape Release," Olympia, WA, 2008.
www.nass.usda.gov/Statistics_by_State/Washington/Publications/fruit/grape08.pdf.
- U.S. Department of Agriculture, National Agricultural Statistics Service, Washington Field Office, "Top Forty Agricultural Commodities, Washington, 2000-2002, and 2005-2007, Olympia, WA, 2006.
- U.S. Department of Agriculture, National Agricultural Statistics Service, Washington Field Office, Interactive Website.
www.nass.usda.gov/Statistics_by_State/Washington/Publications/Specialty_Commodities/index.asp.
- U.S. Department of Agriculture, National Agricultural Statistics Service, *2007 Census of Agriculture*, Washington, D.C., 2009.
- U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Primary Health Care, *Uniform Data System Calendar Year 2012, UDS Reporting Instructions for Health Centers*, pp. 31-32, 34, Version 1.1, 2012,.
- U.S. Department of Labor, National Agricultural Workers Survey, Public Access Data, 2005-2009, Washington, D.C. 2013.
- United States Code*, "Title 42, The Public Health and Welfare, Chapter 6A, Public Health Service, Public Health Service Act, Title III, Part D, Section 330, Migrant Health."

University of California, Cooperative Extension, Crop Budgets and Sample Costs of Production, (various) 2007-2012.

University of Idaho, College of Agricultural and Life Sciences, Cost and Return Estimates (various), 2011

University of Wisconsin, Crop Budgets (various), 2012.

Villegas, Eric, Oregon Employment Department, Foreign Labor Contact, Business and Employment Service Programs, "H2A and H2B Applications, Agricultural and Food Processing Clearance Orders," 2012.

Virginia Garcia Memorial Health Center, Patient Database 2008-2012, received March, 2013.

Washington State University, "Crop Profile for "Spinach Seed in Washington," 2005.
www.tricity.wsu.edu/~cdaniels/profiles/SpinachSeed.pdf.

Washington State University, "Crop Profile for Apples in Washington," 2001.
www.tricity.wsu.edu/~cdaniels/profiles/apple.pdf.

Washington State University, "Crop Profile for Cabbage Seed in Washington," 2007.
www.tricity.wsu.edu/~cdaniels/profiles/CabbageSeed.pdf.

Washington State University, "Crop Profile for Canola in Washington," 2001.
www.tricity.wsu.edu/~cdaniels/profiles/Canola.pdf.

Washington State University, "Crop Profile for Carrots in Washington," 2004.
www.tricity.wsu.edu/~cdaniels/profiles/Carrot.pdf.

Washington State University, "Crop Profile for Christmas Trees in Washington," 2000.
www.tricity.wsu.edu/~cdaniels/profiles/Chritree.pdf.

Washington State University, "Crop Profile for Cranberries in Washington," 2004.
www.tricity.wsu.edu/~cdaniels/profiles/Cranberr.pdf.

Washington State University, "Crop Profile for Dry Peas in Washington," 2001.
www.tricity.wsu.edu/~cdaniels/profiles/DryPeas.pdf.

Washington State University, "Crop Profile for Garlic in Washington," 2002.
www.tricity.wsu.edu/~cdaniels/profiles/Garlic.pdf.

Washington State University, "Crop Profile for Ginseng in Washington," 1999.
www.tricity.wsu.edu/~cdaniels/profiles/Ginseng.pdf.

Washington State University, "Crop Profile for Hops in Washington," 2001.
www.tricity.wsu.edu/~cdaniels/profiles/Hops.pdf.

Washington State University, "Crop Profile for Lentil in Washington," 2001.
www.tricity.wsu.edu/~cdaniels/profiles/Lentil.pdf.

Washington State University, "Crop Profile for Lettuce in Washington," 2000.
www.tricity.wsu.edu/~cdaniels/profiles/Lettuce.pdf.

Washington State University, "Crop Profile for Onion in Washington," 2004.
www.tricity.wsu.edu/~cdaniels/profiles/Onion.pdf.

Washington State University, "Crop Profile for Red Currants in Washington," 2004.
www.tricity.wsu.edu/~cdaniels/profiles/Currants.pdf.

Washington State University, "Crop Profile for Red Raspberries in Washington," 1999.
www.tricity.wsu.edu/~cdaniels/profiles/rsprev.pdf.

Washington State University, "Crop Profile for Sugar Beet in Washington," 2001.
www.tricity.wsu.edu/~cdaniels/profiles/SugarBeet.pdf.

Washington State University, "Crop Profile for Sweet Cherries in Washington," 2002.
www.tricity.wsu.edu/~cdaniels/profiles/cherry.pdf.

Washington State University, "Crop Profile for Table Beet Seed in Washington," 2007.
www.tricity.wsu.edu/~cdaniels/profiles/tableBeetPm2.pdf.

Washington State University, "Crop Profile for Wine Grapes in Washington," 2003.
www.tricity.wsu.edu/~cdaniels/profiles/WineGrapes.pdf.

Waters, Tim, Franklin County Extension, Washington State University, Interview: Pasco, WA, October 7, 2008.

Yakima Valley Farmworkers Clinic, Patient Database 2008-2012, received February, 2013.

Yasui, Maiji, Commission on Children and Families, interview: Hood River, OR, September 17, 2012.