

# Idaho Crop Residue Disposal Smoke Management Program 2004 Season Review

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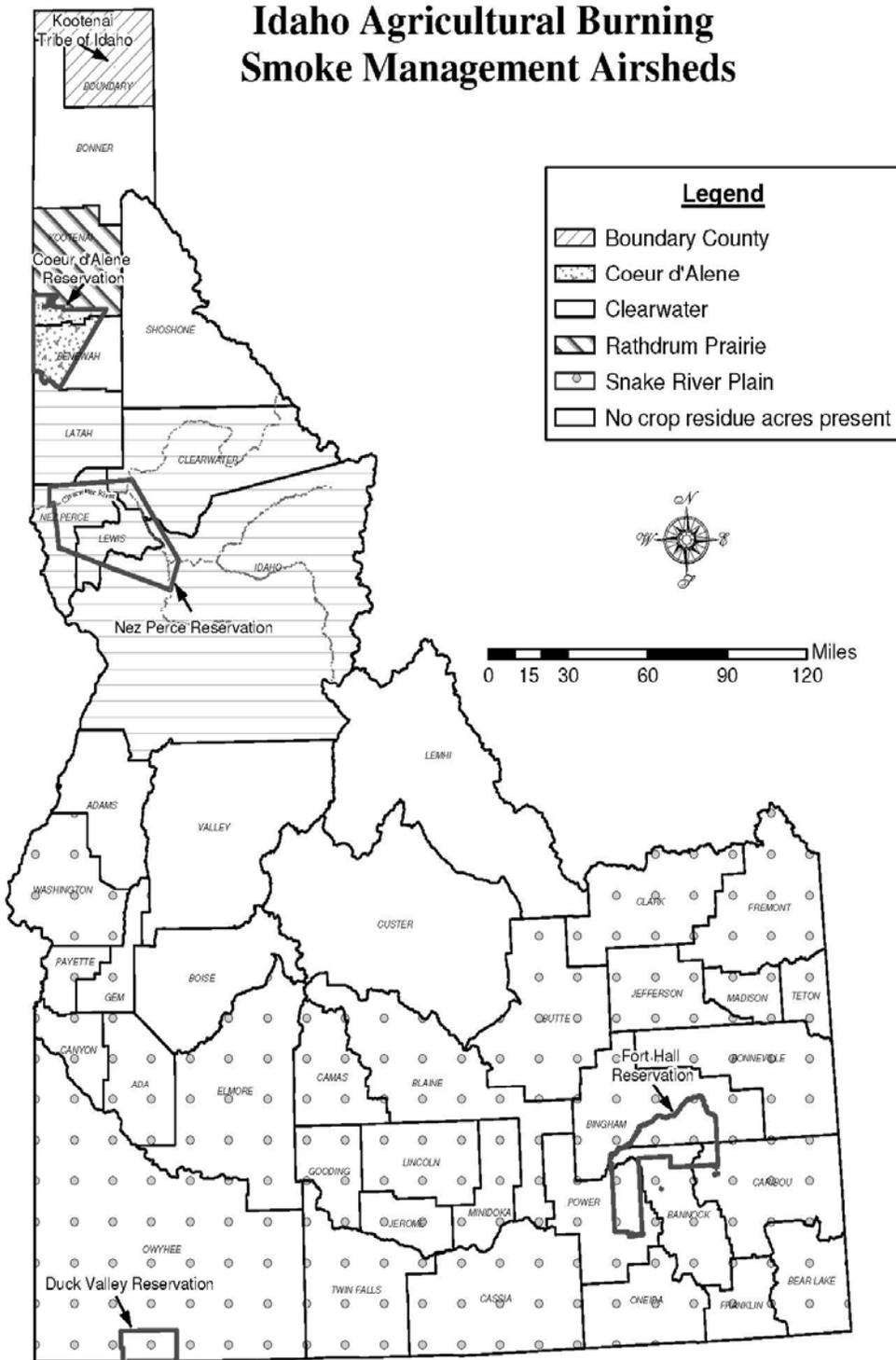
Idaho Department of Environmental Quality

Nez Perce Tribe

Coeur d'Alene Tribe

Kootenai Tribe of Idaho

# Idaho Agricultural Burning Smoke Management Airsheds



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## Abstract<sup>1</sup>

The 2004 Crop Residue Disposal Smoke Management Program (SMP) was administered and operated through the cooperation of several agencies and tribal governments including Idaho State Department of Agriculture (ISDA), Idaho Department of Environmental Quality (IDEQ), Nez Perce Tribe, Coeur d'Alene Tribe, Kootenai Tribe of Idaho, and the US Environmental Protection Agency (EPA). While individual agencies and governments have their own specific regulations, ordinances and rules, the overall purpose of the SMP is to regulate the practice of field burning to minimize the impact on Idaho citizens from smoke generated by crop residue burning. Annual evaluation of the SMP is based on the following criteria (in no particular order): public satisfaction, grower satisfaction, acreages burned, and adherence to air quality standards set forth by agencies within the program.

The 2004 Smoke Management Program's peak crop residue disposal season began on July 12, 2004 and continued through the end of October. The peak burn season began July 20 on the Coeur d'Alene Reservation. There were a total of 110,607 acres registered with the program statewide in 2004, and approximately 89,182 acres were reported burned during the season. The focus of this report will be the peak season. However, outside of the peak season, growers occasionally burn crop residue and are still required to follow the applicable SMP rules. The number of acres burned outside the peak season is considerably smaller and correspondingly, the ISDA, tribes, and other participating agencies deploy fewer resources to operate the program during these times.

Coordination within and between agencies continued to be an important factor in 2004. Operating procedures representing the input of all parties were in place and personnel for each of the major airsheds in northern Idaho were hired and trained in advance of the peak burning season. ISDA and the Nez Perce Tribe contracted with a local meteorologist to provide daily dispersion forecasts and burn recommendations. Conference calls involving all SMP agencies were conducted twice each week-day to share information and to make localized daily burn decisions.

There were several improvements to the program as a result of recommendations made in 2003. A meteorologist based in Spokane, Washington, who was familiar with local weather conditions was hired to provide more accurate airshed-level forecasts. The Nez Perce Tribe hired a second field coordinator for the 2004 season. Upgraded computer equipment for the ISDA field coordinators was provided which improved internet service and access to the tools and products used for making burn decisions.

The ISDA received a grant from EPA to increase public awareness and to provide public outreach. As suggested in 2003, the SMP increased its outreach efforts and worked to make them more effective. Some of the outreach improvements in 2004 included a new ISDA website, televised forecasts, and newspaper advertisements. ISDA, in cooperation with the Washington Department of Ecology, contracted with KXLY Television in Spokane, Washington to provide a televised field burning forecast broadcast throughout the Tier II region during the morning and evening news. This broadcast helped to widen the circulation of public information about the locations of anticipated burns. Daily burn decisions were also published in the Lewiston Tribune. The clarity and usefulness of the daily radio announcements were improved.

The toll-free hotline provided by ISDA and the Nez Perce Tribe was again used as a tool to gather feedback for program personnel regarding air quality complaints and the public's opinion of the SMP. Last season's (2003) annual summary reported a total of 609 complaints from northern Idaho, while the previous season (2002) reported a total of 1,386 complaints. In 2004, the complaint line received 245 complaints. This correlates to a 56% decrease from '02 to '03 and a 60% decrease in the number of complaints received by the hotline from '03 to '04. This calculates to an 82% decrease from the beginning of the program in 2002, to the third season in 2004. This decrease can be attributed to a number of factors, including improvements in the program, as well as the change in wildfire activity from year to year, among others.

While there were many improvements made to the SMP, the team encountered some difficulties as well. Smoke from silvicultural burns (including prescribed and open burning) affected air quality in September and October. In order to insure that the airsheds were not impacted, it was necessary to coordinate with other agencies outside the SMP who also conducted burning during the peak season. This coordination proved challenging.

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<sup>1</sup> In addition to this executive report, the technical reports compiled by the SMP group and published by DEQ in December of 2004 provide information about the burn season.

Weather conditions were a barrier to burning this season as well. The more favorable conditions for burning occurred early, during the month of July when most fields were not ready to burn. The presence of high pressure ridges over the Tier II area for an extended period of time in August resulted in poor ventilation and unusually stagnant air. At the end of August, this high pressure condition was followed by a period of higher than normal humidity and above average precipitation. The combination of these factors made it difficult to burn because it decreased the number of acres the airshed could support on most approved burn days as well as the over all number of approved burn days. Rainy conditions created green-up in harvested grass fields so that by September the fields were more difficult to burn. When burning did occur, the crop residue frequently did not burn completely, took much longer to burn than normal, and the resulting smoke did not disperse effectively.

Eight investigations were conducted by ISDA during the 2004 burning season. Three investigations were conducted during the spring burning season and five were conducted during the normal summer-fall burning season. The investigations resulted in two one-year suspensions for statute violation with three pending legal review. One investigation resulted in no penalty due to the violation occurring in the Tier I area. The remaining two investigations revealed no violation of statute.

Of the eight investigations, five occurred in the Clearwater airshed, two occurred in the Boundary County airshed, and one occurred in the Bingham/Bonneville county area of eastern Idaho.

## Definitions

*Airshed:* A geographic area which, because of topography, geography, meteorology and climate, contains the same air mass. There were five airsheds for the 2004 season in Idaho. Each airshed has its own specific smoke management needs and goals.

*Burn Bans:* Different agencies have various authorities for restricting open burning and other types of fires. The Idaho Department of Lands issues burn permits based on fire safety standards. IDEQ has responsibility to regulate air quality standards outside of Indian Country (as defined by Federal Law). IDEQ has adopted a 1-hour PM<sub>2.5</sub> concentration of 80 µg/m<sup>3</sup> as one of the criteria used for triggering burn bans (consideration must also be given to weather and air quality conditions, as well as source parameters). ISDA adopted a 1-hour PM<sub>2.5</sub> concentration of 64 µg/m<sup>3</sup> (80% of 80µg/m<sup>3</sup>). ISDA ceases all crop residue disposal burning when PM<sub>2.5</sub> concentrations in an area exceed and are predicted to remain above this level. For the purposes of the 2004 SMP season, the Nez Perce Tribe, through a MOA, followed the IDEQ and ISDA burn ban concentration levels.

*Burn Decision:* The decision for each airshed that determines the number of acres allowed to burn, the time of day at which burning can occur, and the extent to which field burning must be observed by the local coordinator. The burn decision is made in a twice daily conference call (the burn call) with input from the entire group and the local coordinator in order to balance local conditions with regional forecasts. A *preliminary decision* is made in the afternoon for the next day. This can be changed the next morning during the *final decision*, depending on improved or deteriorating weather conditions. These decisions are based on the most updated meteorological data available at the time of the call. Whatever the preliminary decision for any day, the proposed burn acreages cannot exceed the agreed limit for any airshed<sup>2</sup>. A *preliminary decision* of “no burn” cannot be changed in the *final decision*.

*Local Coordinator:* Each airshed is managed by one or more local coordinators who oversee crop residue burning in that area. These coordinators use meteorological data as well as input from the SMP team to make a daily burn decision. The coordinators are responsible for contacting and regulating growers who have requested to burn in their area as well as conducting investigations of alleged violations. Each coordinator is in regular contact with the SMP team to keep the group updated on the status of burning in his/her area.

*National Ambient Air Quality Standards (NAAQS):* Health based standards that are established by EPA for six criteria pollutants including particulate matter (PM). These standards are designed to provide an adequate margin of safety for the general public. The NAAQS for PM<sub>2.5</sub> is 65 µg/ m<sup>3</sup> for a 24-hour period.

*PM<sub>2.5</sub>:* Particulate matter less than or equal to 2.5 microns in diameter. Research has shown that PM<sub>2.5</sub> can cause health and environmental effects<sup>3</sup>. Smoke from crop residue disposal contains particles that generally fall into this size category. PM<sub>2.5</sub> concentrations are a good measure of smoke impacts. Higher PM<sub>2.5</sub> values correlate to poorer air quality.

*Registration and Burn Requests:* Under state law, growers are required to register and submit requests to burn their fields at least twenty-four hours in advance. The registration process involves filling out a form with contact information and the legal description and location of each field. In the Tier II areas a \$2 per acre minimum fee is required by the ISDA. Registration and fees required by other agencies or Indian tribes may apply. Once fields are registered, the grower must then call his/her local coordinator to request to burn.

*SMP:* The coordinated crop residue disposal and smoke management program in Idaho. This term includes personnel, plans, components, parties, governments, agencies, or any other aspect specific to the program.

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<sup>2</sup> The SMP agencies agreed on acreage limits prior to the start of the peak season. Airshed acreage limits are listed in the burn protocols of the 2004 Technical Guidance Document.

<sup>3</sup> See EPA website: [http://www.airnow.gov/jump/particle\\_jump.html](http://www.airnow.gov/jump/particle_jump.html) For more information, contact your state or tribal air agency.

## **Introduction:**

### *Background*

The SMP in Idaho has changed considerably in the past few years. It has grown from an informal voluntary program to a multi-agency, highly coordinated program. Idaho's SMP is based on the cooperation of federal, tribal, state, and private organizations working together to balance local and regional smoke management needs.

In order to improve SMP effectiveness, the state has been divided into two tiers and five airsheds. Tier I contains the Snake River Plain airshed, and Tier II contains the airsheds of Boundary County (which includes the Kootenai Tribe of Idaho), Rathdrum Prairie, Coeur d'Alene Reservation, and Clearwater (which includes the Nez Perce Reservation). Growers wishing to burn in Tier II are required to pay a registration fee to ISDA, and are subject to penalties for burning outside the program rules. Each of these airsheds is discussed in this report.

### *Authorities*

The ISDA is responsible for regulating disposal of crop residue under Title 22, Chapter 48, Idaho Code, for all areas within Idaho except for Indian Country. Idaho Code §22-4801 authorizes the director of the ISDA to promulgate rules related to crop residue disposal. These rules are codified at IDAPA 02.02.16.000 et. seq. ISDA works closely with IDEQ, the Coeur d'Alene Tribe, the Nez Perce Tribe, and the Kootenai Tribe of Idaho to meet the overall goals for the SMP, which are outlined in the "Technical Guidance: Meteorological Services and Field Coordinators" document developed by the SMP agencies and published by IDEQ.

The IDEQ has the responsibility to safeguard air quality and limit and control the emissions of air contaminants outside of Indian Country (Idaho Code 39-105(3)(d)). To carry out these responsibilities, IDEQ has adopted rules such as the Open Burning Rule and the Emergency Episode Rule. State statute also directs IDEQ and ISDA to cooperate with local and agricultural communities to establish smoke management and crop residue disposal programs (Idaho Code §22-4801).

The Coeur d'Alene Tribe regulates agricultural field burning within the boundaries of the Coeur d'Alene Reservation pursuant to the Coeur d'Alene Tribal Law and Order Code and Tribal Resolutions. The Tribe has operated its own SMP since the late 1980s. In 2002, the Tribe entered into a Memorandum of Agreement (MOA) with IDEQ and the ISDA to coordinate the Tribe's SMP with the SMP for the Rathdrum Prairie in Kootenai County and the statewide program.

The Kootenai Tribe of Idaho (KTOI) has responsibility for managing agricultural smoke on Indian owned lands within Boundary County. A Tribal Ordinance establishes identical rules and regulations as those implemented by the ISDA, so that crop residue disposal is managed on those lands in a manner consistent with other lands in Idaho. A MOA to better coordinate State-Tribal activities is being reviewed for approval. A MOA exists between KTOI and IDEQ regarding the response to Emergency Episodes that result from poor air quality.

The EPA currently has authority to implement the Clean Air Act within the exterior boundaries of the Nez Perce Reservation and has established a cooperative agreement with the Nez Perce Tribe to develop and implement a SMP for the Reservation. The Nez Perce Tribe, EPA, IDEQ, and ISDA have entered into a MOA to have the ISDA Crop Residue Disposal Rule and the IDEQ Emergency Episode Criteria apply on the Reservation. In this way, the SMP can be coordinated uniformly throughout the Clearwater Airshed and burns can be authorized by the Tribe in parallel fashion to the state program.

## 2004 New and Continuing Improvements

Several improvements were made to the Smoke Management Program prior to the 2004 season as a result of experience and recommendations from the previous year. These improvements fall into five main categories: funding, training, air quality monitoring, tools, and public notification/outreach.

*Funding:* An increase of ISDA fees from \$1 to \$2 per acre for applicable areas increased incoming funds for the program. Other funding to SMP agencies, including EPA grants, was used to help finance many of the improvements, such as outreach and meteorology.

*Training:* Local smoke coordinators and other smoke management personnel attended this season's meteorological and technical training in Pullman, Washington on June 29<sup>th</sup> and 30<sup>th</sup>. This training provided more opportunities than in 2003 by bringing in two meteorologists for more focused MET (meteorological) training, and extending the session from one and a half to two full days. The training also included case studies, an example pibal launch, and other activities.

*Air Quality Monitoring:* Additional air quality monitoring equipment was in operation in 2004, which complemented the existing air quality monitoring that was in place from the previous season. The Coeur d'Alene Tribe deployed a mobile air quality monitoring station that was positioned in the vicinity of Harrison and established an air quality monitoring site in Plummer with a PM2.5 TEOM instrument. The existing air quality monitoring stations included the three monitoring sites in operation on the Nez Perce Reservation, a monitoring site operated by the Kootenai Tribe of Idaho, and all sites operated by IDEQ. All of these sites were in operation in 2003 and continued to be fully operational for the 2004 season. .

*Tools:* Forecasting services and smoke dispersion models were enhanced in 2004 to provide better meteorological support. A local contract fire weather meteorologist was hired to support the SMP during the peak season. The Washington State University (WSU) ClearSky Smoke Dispersion Model used in 2003 for the Rathdrum Prairie, Coeur d'Alene Reservation and the Clearwater Airshed was improved and expanded to include the Boundary airshed. As in the past, the Coeur d'Alene Tribe and Rathdrum Prairie utilized Pilot Balloon (pibal) launches to further refine their daily burn decisions. Other airshed field coordinators released balloons for visual observations. WSU also provided a radar sounding (SODAR) at the Reubens monitoring site in the Clearwater Airshed. Additional equipment was made available to field coordinators including pibal theodolites, portable weather stations, digital cameras, binoculars, and newer notebook computers for all ISDA coordinators. Not all of the new equipment was as widely used as existing equipment, however it did prove useful and will continue to become more so as it is better integrated into the daily operations of the coordinators. High speed Internet access was provided to ISDA coordinators.

*Public Notification and Outreach:* SMP agencies formed a committee to direct and focus the SMP outreach efforts. The ISDA and the Nez Perce Tribe used EPA funding to improve their public outreach capabilities. In addition to the broadcasted daily radio announcements, ISDA cooperated with the Washington Department of Ecology and contracted with KXLY Television of Spokane to provide a regional field burning forecast that was broadcast with the evening and morning news weather report during the burn season. While this activity provided more information to a wider segment of the public, in rural areas where KXLY was not available, public information was limited to newspaper and radio announcements as well as calls to the toll-free hotline. Daily field burning forecasts were provided to the Lewiston Morning Tribune in Lewiston, Idaho to increase public information in that area. The toll free complaint/comment hotline supported by ISDA and the Nez Perce Tribe continued to provide daily burn updates, allowing the public access to the most current field-burning information throughout the season. Due to a coordinated effort prior to the start of the peak burn season, the hotline's notification system showed improvements by providing more timely and accurate information to the SMP coordinators.

Additional improvements to the SMP in 2004 included:

- Additional personnel in the Camas Prairie area of the Clearwater Airshed,
- Better pre-season preparations in all areas of the program,
- Better definition of burn acreage limits by area in the Clearwater Airshed, and
- Improved cooperation and communication between the local coordinators to aid in more effective information sharing and over-all program management.

## 2004 Statewide Season Statistics

Due to the nature of the SMP in Tier I, specific information regarding the total number of acres burned and the number of complaints received statewide remains difficult to obtain. This is caused in part by the large geographic area encompassed by Tier I, the limited resources available to manage the area, and the lack of authority given to ISDA to enforce SMP protocol in the area. The focus of this report will be primarily on the Tier II airsheds.

### *Acreages and Burn Days*

Total Approved Burn Days Tier II: 53 (includes any day where burning was approved somewhere in the 10 northern counties).

Total Confirmed Burn Days Tier II: 49 (includes any day when burning actually occurred in at least one of the 10 northern counties between 7/12/2004 and 10/29/2004)

Total Acres Registered Statewide: 110,607. To streamline the registration process, growers were asked to register all the acres they thought might be burned. Many of these acres were not burned due to the changing needs of the growers and weather conditions.

Approximate number of Registered Acres Burned Statewide: 88,771.

Crop Types: There are several types of crop residue burned throughout the state, each with its own specific properties. Growers indicate the type of crop residue being disposed of when they register their fields. The following table shows the breakdown of which types of crops are registered in each area of the state. "Other" refers to various crop types such as mustard seed, alfalfa seed, pea plant stalks, etc.

<b><i>Acres Registered By Crop Type for Tier I</i></b>					
	Field Type				
County	Turf Grasses	Cereal Grain	Field And Forage Grasses	Other	Total
Ada	12.3		125	265.6	402.9
Bingham		280			280
Bonneville				41.9	41.9
Canyon	64	436.7	89	394.9	984.6
Gem	35	134.2	21		190.2
Jerome		85	200	62	347
Minidoka		256			256
Owyhee	43	102.2			145.2
Payette			57.1		57.1
Twin Falls		61	7	2	70
Washington		325.4			325.4
<b>Tier I total acres registered:</b>					<b>3100</b>

<b><i>Acres Registered By Crop Type for Tier II</i></b>					
	Field Type				
County	Turf Grasses	Cereal Grain	Field And Forage Grasses	Other	Total
Benewah	8542.2	6148.8	300		14991
Boundary	793	7564	581	40	8978
Clearwater	1093.7	6336	10		7439.7
Idaho	3824	9305	554	29	13712
Kootenai-CDA	9654	44	175		9873
Kootenai-Rathdrum	2513			44	2557
Latah	9802	2685	1136	596	14219
Lewis	10007	12719	609	161.2	23496.2
Nez Perce	4318	6362	1399	162	12241
<b>Tier II total acres registered: 107,507</b>					

*Complaints:*

A toll-free number was provided by ISDA and the Nez Perce Tribe to log and receive complaints. To make the best use of the data gathered from complaint calls, each caller was asked specific questions regarding how smoke was affecting his/her area and any comments he/she cared to leave. These questions included the caller's location, whether the caller could see smoke from his/her location, and if he or she were being affected by smoke at this location. By being able to differentiate between general complaints and specific smoke event complaints, smoke coordinators were able to use the information received from the complaint line to help track smoke movement and minimize future crop residue disposal smoke impacts.

The chart below shows the complaint totals for Tier I and II. This table does not include the small number of calls and emails made directly to agencies and tribes rather than to the hotline, or the two test calls made by SMP members. The totals in the table are broken down into two categories: the location of the caller and whether he or she was experiencing smoke at the time of the call. Not all calls made to the hotline were to report the presence of smoke. Some callers were seeking information about burn locations, obtaining permits, program contacts, reporting illegal burns, and making general complaints, etc.

LOCATION	EXPERIENCING SMOKE?			Grand Total
	NO	YES	BLANK	
<b><i>TIER II</i></b>	<b><i>19</i></b>	<b><i>183</i></b>	<b><i>38</i></b>	<b><i>240</i></b>
BENEWAH		1		1
BONNER	4	30	4	38
BOUNDARY		3	3	6
IDAHO		5	1	6
KOOTENAI	4	90	15	111
LATAH	6	13	4	23
NEZ PERCE	1	2		3
SPOKANE	1	7	2	10
WHITMAN		11		11
BC, CANADA	2	18	2	22
NOT INDICATED BY CALLER	1	3	7	9
<b><i>TIER I</i></b>	<b><i>2</i></b>	<b><i>1</i></b>		<b><i>3</i></b>

## Air Quality Management and Analysis

A summary of air quality management and analysis is provided below for the Tier II Airsheds. Air quality was impacted by both silvicultural burning and crop residue disposal. Air quality data have been compared to the 1-hour PM<sub>2.5</sub> agency criteria (see “Burn Bans” under Definitions and Descriptions). While these levels were at times exceeded and may have resulted in not approving burning for the day or halting burning already in progress, the air quality criteria specified under the ISDA and IDEQ rules did not warrant issuance of any actual burn bans due to agricultural burning. IDEQ was required to issue a mandatory burn ban on October 28 due to silvicultural burning for Kootenai County which also included voluntary burn bans in Shoshone, Bonner, Boundary, and Benewah Counties.

### *Clearwater Airshed<sup>4</sup>*

Air quality monitors are maintained by the Nez Perce Tribe and IDEQ at six sites across the airshed. Air quality data were reviewed on a daily basis throughout the burn season and were one of the main tools used in determining burn decisions. Although air quality monitoring data showed significant effects from some of the field burns (a one hour reading in excess of the 64 µg/ m<sup>3</sup> program standard), there were also days when significant acres were burned with minimal effect on air quality. For example, 1,580 acres were burned on August 17, 2004 in the Clearwater Airshed, and the highest monitor reading reached 93µg/ m<sup>3</sup> in Moscow, well above the standard. However, a similar amount of acres, 1,134, were burned in the Clearwater Airshed on October 8, 2004, and the highest monitor reading in the airshed was recorded in Lewiston at 13.9 µg/ m<sup>3</sup>, well below the standard of 64.

Of the 47 burn days approved for burning in this airshed, six (6) days showed impacts greater than the ISDA standard of 64 µg/ m<sup>3</sup>; of those, five (5) days exceeded the IDEQ one-hour 80µg/ m<sup>3</sup> PM<sub>2.5</sub> criteria. Because these impacts were short-term in duration, IDEQ did not issue a burn ban or health advisory in the Clearwater Airshed. There were also 11 days in the Clearwater Airshed when the maximum one hour readings were elevated to between 40 and 60 µg/m<sup>3</sup>. Although the 40-60 µg/m<sup>3</sup> range does not exceed either of the one-hour PM<sub>2.5</sub> criteria, these levels are still considered by the SMP when making burn decisions. The maximum acreage that was burned in any one day was 4358.4 acres with the minimum of 3 acres.

The number of hours of elevated PM<sub>2.5</sub> levels were reduced in Kamiah, Lapwai, Lewiston, Moscow, and Grangeville, but increased in Reubens when compared to the 2003 season. However, problem areas (areas with continued smoke impacts from agricultural burning due to complex local weather patterns) such as Grangeville and Moscow were impacted again this year. There was also concern about the impacts to Kamiah and Reubens on field burning days. Both the Nez Perce Tribe and IDEQ are conducting more critical, in-depth analyses of the season’s meteorological and air quality data. The results of these analyses will be used to help improve SMP operations for next year. The table below summarizes each burn day and lists the highest monitor reading for that day, along with complaint calls to the hotline for the Clearwater Airshed.

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<sup>4</sup> Acreage information in the Clearwater Airshed air quality table includes data from both ISDA and the Nez Perce Tribe.



*Rathdrum Prairie, Kootenai County*

Overall, burning in the Rathdrum Prairie was significantly improved over previous years. This can be attributed to two factors. The first was the reduced number of acres registered to burn and the second was increased meteorological information provided by the meteorologist. With better meteorological information, ISDA Coordinators were able to specifically identify windows for burning on the Rathdrum Prairie. As these windows were restrictive, generally not lasting more than four hours, they did have the effect of reducing the overall number of acres that burned during the day.

There were five designated burn days in which fields were ignited on the Rathdrum Prairie. The daily burn acreage was lower than 2003, in part due to reduced acreages registered to burn. The 2004 field burning ranged from a 300 acre burn day to a 565 acre burn day. The maximum that was burned in any one day was 565 acres on August 30, 2004. On July 29, 2004, an accidental fire was started by a combine and was not included in the five approved burn days listed above. This incident is included in the table below so that the impact of this burn can be compared to the other burns which occurred on designated burn days. The burning on the Rathdrum Prairie was completed from August 4, 2004 to September 1, 2004. Based on the number of complaint calls received, there were far fewer complaints than previous years. The complaint calls were 81% fewer for 2004 as compared to 2003 during the field burning period. Also, the magnitude of the measured downwind impacts associated with field burning smoke was much lower this year than measured impacts from field burning in previous years. Greater oversight, the availability of our local meteorological resource, more careful evaluation of weather conditions, and limitations on acres burned per day contributed to these measurable changes.

Air quality data were reviewed on a daily basis throughout the burn season. Air quality was monitored at six locations that were either adjacent to or downwind of the Rathdrum Prairie. The air quality monitoring data showed that two of the burns affected air quality and were recorded at the Athol and Post Falls sites. The degree of impact for 2004 was minimal; none of the monitors reached the program threshold of 64  $\mu\text{g}/\text{m}^3$  for PM 2.5 and, none of the measured 1-hour PM 2.5 concentration exceeded IDEQ or ISDA criteria. Equally, the air quality criteria specified under the ISDA and IDEQ rules did not warrant issuance of any burn bans due to agricultural burning.

The table below summarizes the five approved burn days, as well as the accidental burn on July 28, PM2.5 levels on these days, and the number of complaint calls made to the hotline. For more in-depth Air Quality Analysis, please see DEQ's "2004 Crop Residue Disposal Smoke Management Program DEQ Technical Review of Boundary County and Rathdrum Prairie Airsheds" which analyzes each of the designated burn days and discusses some of the air quality problems that did occur on the burn days such as smoke impacts in locations where no air quality monitors were located.

Burn Day	Acres Burned	Max. 1-hour PM2.5 Conc., $\mu\text{g}/\text{m}^3$	Hour Ending Time Period, PST	AQ Monitoring Site	Complaints Received by Hotline
Thursday, July 29 *	255	32	5 PM	Post Falls	12
Wednesday, August 4	300	29	3 PM	Athol	16
Tuesday August 17	370	42	4 PM	Rathdrum	17
Friday August 20	450	34	3 PM	Sandpoint	11
Monday August 20	565	19	3 PM	Post Falls	6
Wednesday, September 1	390	33	3 PM	Post Falls	14
Calls to Complaint Line on approved burn days = 76					

\* Thursday, July 29, 2004 field burning was an accidental field fire caused by harvesting operations (combine fire).

## *Boundary County*

The Kootenai Tribe of Idaho works collaboratively with ISDA and provides air quality and meteorological information for the Kootenai River Valley Airshed in Boundary County, Idaho. The Tribe, in partnership with IDEQ, operates an air quality monitoring station located on the reservation, three miles west of Bonners Ferry. The station provides real-time data that was available to ISDA this season either by dial-up access or upon request from the Kootenai Tribe. Due to technical difficulties ISDA was unable to use the dial up access option so air quality information was generally provided to the program over the phone or by email. The information that is available from the station includes particulate matter (PM<sub>2.5</sub>) concentrations, ambient temperature at three and ten meters, wind speed, barometric pressure and wind direction.

In 2004 Boundary County growers burned on 13 days during peak season. Acres burned per day ranged from a low of 50 acres for test burns to a high of 1,665 acres. The current airshed prescription for Boundary County established limits of 2,400 acres for a burn day and 600 acres for a conditional day. Maximum hourly impacts recorded at the Kootenai Tribe air quality site and complaints received by the hotline are identified in the table on page 14.

Weather was the main factor that affected SMP operations in Boundary County during 2004. Poor dispersion conditions and periods of high precipitation limited the number of days for burning. This resulted in a backlog of acres as the season progressed. The few bluegrass fields that are in the valley experienced new growth and green-up while waiting for a good burn day. This further compounded the ability to burn these fields during the later part of the 2004 season.

The field coordinator in Boundary County has fewer technical resources available for making a burn decision as compared to other airsheds in Tier II. The field coordinator released balloons for visual observations during the season but did not have the resources available to conduct pibal measurements. The ClearSky model was expanded to include Boundary County this year. WSU developed a field selection page to allow the smoke management team to develop various scenarios as needed.

The University of Washington MM5 website provided forecast products that include Boundary County in the 4 km and 12 km domains, but little work has been done to reconcile the forecast products with actual weather conditions in this airshed and thus the forecast products, especially the Ventilation Indices that predict surface winds (20 meters), were very unreliable. The simple balloon release and observation helped provide more accurate information on the direction of winds that the weather models had difficulty predicting.

An assessment of the burn day decisions was more difficult in this airshed because of the limited air quality data available as compared to other areas. The Kootenai Tribe of Idaho operates an air quality monitoring site on the reservation located northwest of the City of Bonners Ferry. As described earlier in this report, the Tribal air quality site collects PM<sub>2.5</sub> data and surface weather data. Because of the prevailing winds in the valley, the Tribe's site is in a location that is generally upwind of the field burning. Additional monitoring sites are needed to better understand how agricultural burning, wildfires and silvicultural burning contribute smoke to the airshed

The PM<sub>2.5</sub> data for the field season shows that the Kootenai Tribe site did not capture any significant smoke impacts. Hourly concentrations stayed below the regulatory trigger levels described earlier in this report. This data shows that the smoke management program was successful in managing smoke in the southern part of the Kootenai River Valley. PM data from the air quality monitoring site in Creston, BC (operated by the Provincial government) has not been evaluated for smoke impacts during the 2004 season. Plans to install additional PM<sub>2.5</sub> continuous monitors in the Creston Valley prior to the burn season were delayed. A new site and additional monitors in the Creston area should be functional by the 2005 season. Complaints from the Creston area were also down compared to last year. This can possibly be attributed to both a significant decline in wildfire smoke from 2003 to 2004 as well as the efforts of the SMP to minimize downwind impacts in the Creston area.

Information about air quality in Boundary County can be found in the following table obtained from the DEQ report (2004 Crop Residue Disposal Smoke Management Program DEQ Technical Review of Boundary County and Rathdrum Prairie Airsheds, December 2004). This table gives the date of each day field burning occurred, acres burned, time and value of the highest PM2.5 concentration, and the number of complaints that were received by the hotline.

Burn Day	Acres Burned	Max 1-hr PM2.5 conc. ( $\mu\text{g}/\text{m}^3$ )	Hour Ending Time Period (PST)	Complaints Received by Hotline
8/9/04	50	35	13:00	
8/20/04	100	15.6	20:00	
8/31/04	310	5.5	10:00	1
9/8/04	1665	35.8	12:00	14
9/20/04	100	5.2	12:00	
9/21/04	311	5.1	10:00	
9/22/04	952	9.1	16:00	1
9/23/04	700	8.8	23:00	1
9/24/04	74	8.2	08:00	
9/27/04	161	8.0	15:00	
10/5/04	275	11.7	23:00	
10/8/04	1442	30.5	15:00	1
10/12/04	200	15.8	00:00	2
Calls to Complaint Line on approved burn days = 20				

## **2004 Season Discussion of Issues, Solutions, and Recommendations**

### *Operations and Protocol*

#### Discussion

Prior to the start of the 2003 season, a set of protocols was developed by the SMP team for meteorological services, local coordinators, and the burn decision making process. These protocols were published by IDEQ in a document "Technical Guidance: Meteorological Services and Field Coordinators." This document was updated for the 2004 season.

Due to the complex terrain in the Clearwater Airshed, the smoke management areas were divided among five field coordinators: three ISDA coordinators covering acreage outside of the Nez Perce Reservation boundaries and two Nez Perce Tribe field coordinators covering areas within the exterior boundaries of the Reservation. Fields north of the Clearwater River were in the northern airshed limits and those south of the river were included in the southern limits. In the protocols these areas are respectively referred to as the Palouse (northern Clearwater Airshed) and the Camas (southern Clearwater Airshed) Prairies. In the 2003 season some confusion developed when fields north of the Clearwater River had to be included in the burn limits for the Palouse Prairie but managed by the Camas Prairie coordinator. For the 2004 season, this issue was addressed and clarified, helping the process to run more smoothly.

Meteorological tools, which include forecasting and smoke dispersion models, are important to the operations and protocol of the SMP. The SMP team received training in the use of these tools at the beginning of the season and used a variety of tools each day to make burn decisions. As the season progressed, the SMP team became more experienced at reconciling the meteorological tools with local conditions to identify the product that worked best for their geographic area. In areas of frequent or high impact, further work is needed to develop and evaluate the tools that provide the most accurate forecasts. WSU's ClearSky smoke dispersion model also provided the team with predicted plume trajectories for the Tier II airsheds. Other weather observations were obtained by using weather balloons, including pibals. The local meteorologist was also a valuable resource in the 2004 season.

The daily burn decision was another important area of operations and protocol during the burn season. The number of acres to be burned on a particular day was determined in two daily conference calls in which conditions were discussed and the number of acres decided on. A preliminary burn decision was made the afternoon before the burn and a final decision was confirmed during the morning call on the day of the burn. It was important that this daily burn decision process be completed in a timely and efficient manner to meet tight time schedules and other program needs, such as dissemination of information to the public.

In the 2003 season, there was confusion among some SMP team members regarding the flexibility to change a burn decision once the preliminary decision was publicized. For the 2004 season, it was determined that approved burn acreages could be increased from the preliminary to the final decision when dispersion conditions supported it. However, as with the previous season, once a "No Burn" decision was made it could not be changed, even if the conditions improved between the preliminary and final determinations.

Achieving effective communication and information sharing with agencies outside the SMP who conduct or authorize burning was an issue. Coordinating agricultural burning with silvicultural burning was challenging. There were instances when smoke from silvicultural burning in Idaho and neighboring states began to degrade air quality. For instance, on October 28<sup>th</sup>, 2004, IDEQ was required to issue a mandatory burn ban for Kootenai County which also included voluntary burn bans in Shoshone, Bonner, Boundary, and Benewah Counties due to silvicultural burning.

The SMP team works with the Idaho Department of Lands (IDL) which issues required burn permits to growers prior to their approved burns. Growers are required to attain burn permits before being allowed to light their field(s) during the IDL burn permit season which extends from May through mid-October. In cooperation with the SMP, IDL would not issue burn permits until they received a list of approved growers from the field coordinators or agency leads. This process did not always run smoothly and warrants attention in future burn seasons.

#### Recommendations

With each new season, the operation of the program becomes more streamlined. The 2004 season saw many improvements in the area of operations and protocol, but some improvements can still be made for the 2005 season. In order to improve the SMP for 2005, some suggestions have been made.

- **Hire Additional Personnel:** One recommendation to improve the SMP next year is to hire more personnel, especially in the Boundary and Clearwater Airsheds. There were times when the lack of local coordinators resulted in insufficient time, lack of resources, and an excess of duties required of each local coordinator. In response to this recommendation, ISDA is considering hiring additional personnel for Boundary County and the Clearwater Airshed.
- **Develop More Effective Field Burn Protocols for Areas of Unique Geography/Population considerations:** Locations that have historically proven difficult to manage due to either their unique geography or location within the population, such as Grangeville and the Boundary County/Creston area, would benefit from an analysis of meteorological and monitoring data.
- **Improve Communications and Information Sharing With Other Agencies:** Developing communication and coordination agreements with other agencies who also burn would allow for better burn decisions made by the SMP team and ensure that each agency and program can achieve its goals without impeding the others.
- **Increased Monitoring, Forecasting, and Data Access Capabilities:** It would be beneficial to have improved meteorological, forecasting, and air quality data capabilities on the Camas Prairie for the areas of Grangeville and the Clearwater River valley. Recommendations have also been made to install air quality monitors and/or meteorological equipment close to the Canadian border. It takes a considerable amount of staff time to track air quality data throughout a burn day, so creating quick web-based access to all real-time monitoring data across the Tier II area would also be an improvement to the program. Additional improvements for the ClearSky model and its integration with other models are recommended.
- **Continue with Local Meteorologist:** Having a meteorologist this season who was familiar with fire weather and local conditions was an invaluable addition to the program. Continuing with this arrangement in future seasons will be beneficial to all involved. To assist in developing improved localized forecast, the meteorologist should conduct site visits to each airshed during the burn season. Improvements to the forecast format will help to alleviate the amount of time reading through the daily forecasts prior to the conference calls.

### *Public Relations and Outreach*

#### Discussion

Public relations and outreach are an important part of the SMP. The main objectives of public relations are twofold; public awareness and grower outreach. The outreach subcommittee formed this season was helpful in focusing the SMP's outreach objectives. The SMP's public relations efforts consisted of six items; daily television forecasts, daily radio announcements, website, complaint line, grower hotline, and grower workshops. It was hoped that among these six methods the growers and the public would be well informed about crop residue disposal in their area. While these methods appeared generally effective, there was also room for improvement.

The addition of television forecasts was an improvement in disseminating information effectively to the public. ISDA, through a grant from EPA and in cooperation with the Washington Department of Ecology, contracted with KXLY Television in Spokane, Washington. KXLY used the information provided by ISDA and Washington Department of Ecology for a north Idaho/eastern Washington area burn forecast. This forecast was aired several times daily and reached people in the broadcast area. Considering this was the first season the SMP program used television broadcast, the system ran smoothly. There are still some improvements that can be made however, such as expanding the broadcast area and reaching non-network cable subscribers.

Daily radio announcements based on the preliminary burn decision were sent out each afternoon to a contract broadcaster. This information was then pre-recorded and played the next morning at around 7:45 AM on the following stations: KEYF Oldies 101.1 FM, KDRK Cat Country 94 FM and KGA NewsTalk AM 1510. On some days, due to deteriorating conditions or a decrease in acres requested, the final burn decision was changed from a "Burn" to a "No Burn." Due to the constraints of timing required to set up

the announcements, it was not possible to run an updated announcement of the final burn decision. Burn acreages were not announced on the radio in 2004, as this caused confusion with the public in 2003. Instead, the radio announcements stated only whether there would or would not be burning in each county. This allowed the burn coordinators more flexibility in determining the number of acres to be burned without the risk of confusing the public. There were still complaints made to SMP team members from members of the public that the radio announcements were too fast or hard to understand. The outreach subcommittee will work to address this issue for 2005.

The ISDA's website was another source of public information. Based on the recommendations from the 2003 season, a completely new website was built for 2004. There were several benefits to having a website, such as up-to-date information available 24 hours, a place to link the public to other agencies, and a way of making a large amount of information about the program available to both the public and to program personnel. The new website included more information than the 2003 site, including program history and goals, links to rules and laws relating to the program, and an explanation of burn decisions. It was also designed to allow coordinators and SMP members greater ease of use and to alleviate confusion. The new website also offered the option of submitting complaints and comments via of email. There were no major technical problems with the website. ISDA is still working to make the new website as user friendly and informative as possible for the next season.

The other main public outreach tool was the toll-free complaint hotline. This system was established in such a way to accomplish three major objectives:

- To allow the SMP a regional view of how smoke was affecting citizens in each area
- To allow the SMP to receive real-time feedback regarding smoke impacts on communities; and
- To enable local personnel to respond to complaints in a timely manner.

ISDA and the Nez Perce Tribe worked closely with the hotline contractor prior to the 2004 burn season to fix many of the problems experienced in 2003. Complaints were documented and sent to the SMP team in a more reliable manner, however, there were still a few instances of complaints received late or not at all by some members of the program. The format of the complaint information was also changed to better reflect the nature of the complainant's call. A more specific set of questions was asked of each caller to help coordinators get a better idea of how smoke affected certain areas. There are still issues that need to be addressed such as the quality of interaction with the public and the clarity of information recorded by the service.

The service was provided by ISDA and the Nez Perce Tribe through a contract with a private business and provided a toll-free number that citizens could call to leave a complaint or comment regarding crop residue disposal. Citizens could also call the hotline to receive the most current burn information. Calls were received from a wide range of areas, including all of northern Idaho, eastern Washington, and British Columbia, Canada. Callers were given the option to listen to burn information or to speak with an operator. Comments or complaints were transcribed into text and emailed to the SMP team. If a caller requested a return call, the appropriate local smoke coordinator would contact that person as soon as possible. The format of these complaint calls is shown in the following figure:

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=====
Fri 17-Oct-03 03:03p amd  TAKEN
NAME::XXXX XXXXXXXXXX
PHONE::(XXX)-XXX-XXXX
CITY::COEUR D'ALENE TRIBE          STATE::ID
COUNTY::KOOTENAI
STATE: ID
ARE YOU EXPERIENCING SMOKE AT YOUR LOCATION: YES
ARE YOU SEEING SMOKE FROM YOUR LOCATION: YES
BRIEF DESCRIPTION OF PROBLEM: THE SMOKE IS THICK TODAY AND IT IS
BOTHERING HER
CALL.BACK: NO

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The grower hotline is a toll free number that connects growers to the main ISDA office in Boise. This hotline is used to help growers register and to answer questions or concerns they may have. The grower hotline also accepts calls from non-growers who have questions or comments about the program. There were no significant problems with this resource during the 2004 season.

In addition to the grower hotline, workshops were held in the Tier II airsheds prior to the peak burn season so that growers could learn about the SMP process and its requirements. These workshops were designed to educate growers about their responsibilities for burning within the constraints of the program. Topics covered at these meetings included the registration and request process prior to burning a field, best burning practices, SMP agencies and their authorities, air quality issues, and health impacts of smoke. While growers generally found these workshops helpful, low attendance was an issue in 2004.

Recommendations

- Outreach Effectiveness Evaluation: An assessment of the current outreach techniques needs to be conducted to help focus development of new ideas and to help improve existing techniques. Surveys of the growers and the public to determine which methods of outreach they found the most useful may be a good way of conducting this evaluation.
- Radio Announcements: Changes and improvements to the radio announcements, including quality, timing, and accuracy will be addressed.
- Website: Some proposed changes for next year include having a printable and email-able burn log sheet for the coordinators which can be easily sent to agencies like IDL. There have been several suggestions for improving the usability of the website, that will be followed through with for the next season.
- Grower Workshops: Workshops need to be provided earlier in the year and better publicized in order to improve grower participation. There needs to be more focus on educating growers about the program and best burn practices for next season.
- Public Open House Meetings: In addition to grower’s workshops, public meetings should be held in the communities affected by agricultural smoke to allow for public feedback and education. Complaints alone are not enough to gauge public satisfaction with this program.

**Conclusion**

Now in its fourth year, there have been many improvements to the program which merit its continued support by state, federal, and tribal agencies. Since its inception as a coordinated statewide program in 2001, focus has begun to shift from how to improve the SMP to how to maintain it as an effective and necessary function of state and tribal government. Discussion regarding future funding and long term plans for the SMP has been opened and it is hoped that the program will find continued support and improvement.

## **Airshed Summaries**

### *Tier I:*

#### Snake River Plain Airshed :

Tier I is the region of Idaho comprised of the Snake River Plain Airshed. Tier I is an area where crop residue disposal is not viewed as a significant problem. The main goal for this airshed is to spread awareness of the SMP while helping growers come into compliance with the rules and regulations of the program.

Management of Tier I has not previously been addressed to the same extent as that of Tier II. However, efforts to improve the program in this area, including increased grower training workshops and general outreach, are being made.

The main problems encountered in the Tier I area include unapproved burning and a lack of grower awareness. These two issues are caused mainly by geographic and regulatory factors. The large and sparsely populated area encompassed by Tier I makes it hard to efficiently inform growers of SMP rules and regulations. The lack of enforcement authority and resources make it difficult to regulate crop residue disposal in this area.

While the number of smoke impacts appeared to be minimal (based on available information), the cooperation and education of growers did not show a significant improvement. Once the SMP for Northern Idaho is well established, it is important that focus be given to this part of the state and that serious improvements be made.

### *Tier II Airsheds:*

Tier II is comprised of the four northern airsheds: the Clearwater, Coeur d'Alene Tribe, Rathdrum Prairie, and Boundary County. Tier II has a higher concentration of crop residue disposal acreages and a more complex geographical terrain. Combined with a relatively higher concentration of people, these attributes make it necessary to monitor burning more closely to avoid smoke impacts from burning in Tier II airsheds. Some airsheds have additional objectives regarding the specific needs of the area.

#### Clearwater

The Clearwater Airshed includes the counties of Clearwater, Idaho, Latah, Lewis, and Nez Perce and encompasses the Nez Perce Reservation. A MOA is in place between ISDA, IDEQ, EPA and the Nez Perce Tribe to coordinate the SMP throughout the entire Clearwater Airshed so that procedures and protocols are implemented in a parallel fashion.

For the purposes of managing burns and establishing acreage limits, the Airshed was subdivided into the Palouse and Camas Prairies. The Palouse Prairie covers the areas north of the Clearwater River and south of the Benewah and Shoshone County borders and includes areas on and off the Nez Perce Reservation. In 2004 the Palouse was subdivided into north and south, with a coordinator for each area. The Camas Prairie is situated south of the Clearwater River and also includes areas both on and off the Nez Perce Reservation. The area off the Reservation is managed by ISDA. On the Nez Perce Reservation, EPA currently has authority to implement the Clean Air Act, and the Tribe operates the SMP on EPA's behalf through a cooperative agreement.

In order to best present the information for the Clearwater Airshed, this section has been broken down into the Camas Prairie and the Palouse Prairie. Because Clearwater and Nez Perce counties contain areas in both the Camas and Palouse prairies, lying as they do both north and south of the Clearwater River, and because there is one coordinator for these two counties off reservation, it is difficult to separate acreages in these counties between the two prairies. For the purposes of presenting the correct county-acreage figures in this report, all areas in Clearwater and Nez Perce counties will be discussed in the Camas section, even though some parts of these counties can technically be classified as existing in the Palouse. Since the large majority of acreages in the Palouse Prairie are found in Latah County, the discussion of the Palouse will be contained solely to Latah county.

- Camas Prairie

In the Camas Prairie, burning occurred on 40 days within the Nez Perce Reservation boundaries, and 27 days off reservation. There were a total of 36,314.6 acres registered on the reservation, of which 34,376.9 were burned (since January 1, 2004).<sup>5</sup> Off reservation there were a total number of 18,976 acres registered, of which, 15,412 were burned. On burn days, four complaints were received from areas within the reservation and one from off the reservation

For the 2004 season, the Nez Perce Tribe hired an additional field coordinator to help with fields within the reservation. Improved cooperation and communication between tribal coordinators and ISDA coordinators helped in managing burns in the airshed, as well as areas near the reservation borders where fields can often be divided between reservation and non reservation lands.

Some problems were encountered on the Camas Prairie. The biggest problem the SMP team dealt with this year throughout northern Idaho was the impact of terrain on localized weather and smoke dispersion. Poor weather conditions occurred in the months of August and September. This included more stagnation events, higher than normal humidity and excess precipitation (as compared to previous seasons). Although forecast information significantly improved with the hiring of the local meteorologist, there were still times when meteorological forecasts and predictions differed from observed conditions. Data inadequacies in the forecast models often do not reflect localized weather effects which can make burn decisions and smoke management challenging. As with the previous season, Grangeville and the Clearwater Valley were an issue due to their unique location and the geography of the area. Further analysis of these areas and the conditions which cause smoke to impact them need to be done.

There are some concerns about field burning practices and communicating effectively with other agencies which need to be addressed for 2005. There were some problems with information coordination between the SMP and IDL when IDL was issuing burn permits to growers. There were several days in October where prescribed burning interfered with agricultural burning, as well as days where prescribed burns occurred when conditions were poor enough to prohibit agricultural burning. Some smoke incursions occurred due to prescribed burning during this time.

Recommendations for the Camas Prairie for 2005 include; more targeted and better advertised grower workshops, improved outreach to both growers and the public, improved coordination with IDL and other agencies, continued study of how geography affects local weather patterns, and what combination of conditions, location, and specific fields leads to best burning with least impacts.

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<sup>5</sup> Acreage numbers for the Nez Perce Reservation listed in this section are those submitted by the tribe. Acreage numbers for areas off reservation are taken from the ISDA database.

- **Palouse Prairie**

In the Palouse, burning occurred on 28 days. There were 14,219 acres registered and 11,448 acres burned. There were 23 complaints received from Latah County.

As with the Camas Prairie weather conditions proved to be the biggest problem this season in the Palouse. There were some smoke intrusions into Moscow, as well as some issues with coordinating with nearby burning in the state of Washington. There were also issues with effectively communicating with IDL, grower education, and field green-up. Despite negative field and weather conditions, the only area that had a significant amount of unburned acres was the Weippe Prairie. Due to its location, field harvest takes place at a later time than the surrounding areas. This factor, coupled with the abnormal weather conditions, led to a very short burning season. This resulted in the inability to burn approximately 1,000 acres of wheat stubble.

Recommendations for the Palouse Prairie are similar to those in the Camas Prairie. Further education and outreach to growers is needed. Improved communication with IDL is necessary. Issues with prescribed burning also need to be addressed for the 2005 season. Continuing and improved communications with agencies from bordering states in the future will also help prevent cross-border impacts.

#### Coeur d'Alene Indian Reservation

The Coeur d'Alene Indian Reservation lies in both the northwest half of Benewah County and the southern section of Kootenai County, bordered on the west by the state boundary. Management of field burning in this area is provided by the Coeur d'Alene Tribe. Accomplishing the main SMP goals in this area require establishing policies and procedures to control and monitor crop residue disposal within the Coeur d'Alene Indian reservation, as well as enforcing those policies.

Burning occurred on 27 days within the Coeur d'Alene Reservation airshed this season. There were 24,805 acres registered within the reservation. Of these, 21,135 acres were burned. There were a total of 11 complaint calls received from areas within the reservation.

Considering the fact that smoke management has a long and successful history on the Coeur d'Alene Reservation, this year did not deter from that record. There were minimal complaints received from citizens on the reservation and growers were able to complete their burning in a timely and efficient manner. It is hoped that the continuing close work between Coeur d'Alene Tribe and ISDA will lead to continued improvements for the program. The process of communication between the two agencies was streamlined. Refinements of the registration process allowed increased efficiency. In 2004, the Tribe collected meteorological and PM2.5 data at Plummer and also used a portable PM2.5 monitor during the field burning season in smoke sensitive areas.

#### Rathdrum Prairie

The Rathdrum Prairie growing area is bordered by the cities of Coeur d'Alene/Hayden to the east, the city of Post Falls to the south, the Idaho/Washington State border to the west and the City of Rathdrum to the north. Field burning in this area is managed by ISDA. The main goals in this area are those of the general SMP program. There are no significant secondary goals.

Burning was approved on five days this season, with one incident of accidental, unapproved burning on July 29 due to a combine fire. There were 2557 acres registered. Of these acreages, 2330 were burned during five days of authorized burning, and 227 acres burned in the accident mentioned above. There were a total of 90 calls made to the complaint/comment hotline regarding the Rathdrum Prairie. Of these 90 calls, 30 were general complaints, nine were for information, 50 were smoke complaints, and one was in support of the program. This represents an 81% decrease of smoke related complaints from the 2003 field burning season.

The Rathdrum Prairie Airshed is challenging due to the location of highly populated areas that surround the major bluegrass seed producing fields. Therefore, efforts are conducted to ensure that smoke does not affect the larger metropolitan areas adjacent to the Rathdrum Prairie and that meteorological conditions are adequate to prevent the resulting field smoke from affecting other communities downwind. The major concern for the Rathdrum Prairie is the relatively narrow smoke corridor due to the location of these surrounding communities. If smoke strays from this corridor, communities can be impacted. Because of the very narrow window available, wind speed and direction, as well as ventilation must be closely

monitored and constantly evaluated during burning operations to ensure smoke does not stray out of the low impact corridor.

Recommendations for next season include additional weather monitoring equipment and additional personnel to act as local coordinators. Grower education is not a large concern. Because the SMP has such a high profile in this area, growers are cooperative and willing to work within the constructs of the program.

### Boundary County

Most of the crop residue disposal activity in Boundary County occurs in the Kootenai River Valley. ISDA has jurisdiction over most of the area with the exception of Indian owned lands. The Kootenai Tribe of Idaho has enacted Tribal laws providing for identical rules and regulations as that of the State of Idaho for the management of the SMP on Indian owned lands and provides air quality monitoring and meteorological information for the program. The Tribe and ISDA worked cooperatively throughout the season to assure that the needs of both parties were met and will continue this effort next year. This is the second year that the Boundary County area has been included in the Tier II grouping. This season Boundary County was added to the Clearsky Model for smoke plume prediction. The meteorological support was generally better for this airshed, and the addition of a DSL line for the local coordinator helped a great deal as well. As with last season, the goals for this area were twofold. The first was to raise awareness and foster a working relationship between local growers and the SMP. The second was to continue the cooperative working relationship with the Kootenai Tribe of Idaho.

This year in Boundary County there were 8,978 acres registered with 6340 of those acres burned. There were 17 approved burn days with burning occurring on 13 of those days. The complaint calls this year were greatly reduced from a total of 161 in 2003, to a total of 28 in 2004. The cooperation between the ISDA coordinator and the growers has been good but additional training on burn techniques is needed.

The primary smoke management challenge in Boundary County continues to be the impact terrain has on localized weather and the dispersion of smoke. The Kootenai River Valley, where most of the burning occurs, has steep drainages that create localized gap winds and wind patterns. This year the weather was a major factor as well. Weather patterns of extended stagnant conditions hampered efforts to burn early in the season. In August there was a two-week period of rain that interfered with burning and harvest as well. The ability of the ISDA smoke coordinator to access real-time air quality and meteorology data while burning remains a problem. The forecasts this year were more accurate for upper level conditions than last season. This year Boundary County was available for the first time in the Clearsky Modeling Program. However, it was not a frequently used tool because of technical difficulties with the program itself, and the fact that the program was off-line on several occasions. Recommendations for next year include upgrading technology so that field personnel have more access to real-time weather and air quality data. Another person on staff would help to provide better coverage of the airshed, improve smoke tracking capabilities, and work with KTOI to gather pibal data for the meteorologist.