UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 10 2009

OFFICE OF PREVENTION, PESTICIDES AND TOXIC SUBSTANCES

James H. Lecky, Director
Office of Protected Resources
National Marine Fisheries Service
13th Floor, 1315 East-West Highway
Silver Spring, MD 20910

Dear Mr. Lecky:

This letter describes how EPA will implement the National Marine Fisheries Service (NMFS) biological opinion (BiOp) issued November 18, 2008. Consistent with the goals of the BiOp, EPA intends to comply with the Endangered Species Act (ESA) by requiring changes to the registrations of the pesticides included in the BiOp to assure that registered use of these pesticides will not result in likely jeopardy to the continued existence of federally listed threatened or endangered species or destroy or adversely modify their designated critical habitat. EPA has developed implementation measures consistent with the BiOp which will meet our obligations under section 7(a)(2) of the ESA.

The BiOp and EPA's implementation specifically focuses on three registered organophosphate or OP pesticides (chlorpyrifos, diazinon and malathion) and their potential effects to 28 threatened or endangered Pacific salmon and steelhead species in the states of California, Idaho, Oregon, and Washington (Pacific Northwest states or PNW states). NMFS BiOp concluded that for all but one of these species, continued use of the three OP pesticides would result in jeopardy to the species if additional restrictions are not imposed. In order to reduce pesticide exposure to a level where no likely jeopardy would be expected NMFS recommended six specific changes to the registration of the three OP pesticides. [1] The six items recommended by NMFS can be summarized as: 1) a requirement for spray drift buffers, 2) a wind speed restriction, 3) a requirement for a non-cropped vegetative runoff buffer, 4) a soil moisture/48 hour storm restriction, 5) a fish mortality incident reporting requirement, and 6) an effectiveness monitoring program for off-channel habitats. The full text of the six items as recommended by NMFS is provided in Section A of the Technical Appendix to this letter.

As summarized below and explained in more detail in the Technical Appendix to this letter, EPA plans to implement measures that will achieve the protections sought by each of the six items in the BiOp. EPA will achieve the protection goals of the six items through the methods outlined by NMFS in the BiOp or by alternative methods that EPA's scientific analyses determined will achieve the same purpose while minimizing the burden on food and fiber production in the United States and on pesticide users more generally. Items one through five would be accomplished by changes to pesticide labeling. By changing pesticide labeling to reflect new use limitations, those limitations become enforceable under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). EPA intends to work with NMFS to determine how best to achieve the goals of the monitoring study

[1] These proposed limitations on use were provided as distinct elements of a Reasonable and Prudent Alternative (RPA) under the Endangered Species Act.

described in item 6. EPA will require the registrants of the affected products to fund and carry out the monitoring study. We anticipate these new use limitations will result in a significant reduction in use of these three OP pesticides in the portions of California, Oregon, Washington and Idaho that support Pacific salmon and steelhead.

Because use limitations related to endangered species protection are geographically specific, EPA has developed a Web accessible application *(Bulletins Live!)* that will be used to relay the new labeling information to pesticide users. The use limitations will be applicable to all freshwater[2], estuarine and near shore marine habitats including bays within the range of each species. EPA will use the ranges of the species as outlined by NMFS in their GIS files found at http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-populations/Maps/Index.cfm, to show pesticide users where the use limitations apply.

Below is a summary of how EPA intends to address each of the six items to achieve the exposure reductions NMFS has determined are necessary to preclude jeopardy to the species[3]. A more in depth discussion of each of these items is provided in the Technical Appendix to this letter.

ITEM #1 – Spray Drift Buffers: NMFS recommended that use of the pesticides not be permitted within 500 feet of salmon and steelhead habitats when applied by ground nor within 1000 feet when applied by air. EPA intends to require spray drift buffers adjacent to salmon and steelhead habitat but will impose different width buffers depending upon several factors that affect how far a pesticide might drift from the application site. The buffers EPA intends to impose will vary depending on application rate, spray droplet size, and water body size but in no case will be less than 100 feet to account for run-off in addition to drift. The buffers EPA intends to impose will achieve risk reduction comparable to that estimated using the buffer distances and application assumptions NMFS used in their BiOp. *(SEE TECHNICAL APPENDIX – SECTION B)*

ITEM #2 – Wind Speed Restriction: NMFS recommended that applications of the three pesticides not be permitted when winds are >10 mph immediately prior to application. They further recommended that applications adjacent to salmon and steelhead habitat commence on the side of the field nearest the water and proceed away from the water. EPA intends to require these provisions as NMFS recommended them.

ITEM #3 - Non-cropped Vegetative Runoff Buffer: NMFS recommended that for agricultural uses, EPA require a 20 ft minimum strip of non-crop vegetation (on which no pesticides could be applied) on the downhill side of the application site immediately adjacent to any surface waters that have a connection to salmonid-bearing waters. Such vegetative buffers are generally intended to reduce the extent to which a pesticide might enter a water body by runoff, across the land surface. Such buffers can be effective if diligently maintained but can also become conduits for pesticide runoff is not well maintained. For this and other reasons noted in the Technical Appendix, EPA does not intend to

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[2] . For purposes of these measures, "freshwater habitats" include flowing water and water that may be only temporarily connected to flowing water including intermittent streams, off-channel habitats, drainages, ditches, and other man-made conveyances that lack salmonid exclusion devices.

[3] Due to the very similar nature of the items constituting the reasonable and prudent alternative and the items in the reasonable and prudent measure related to the Ozette Lake sockeye salmon (the one listed species for which jeopardy was not concluded), and the similarity in the provisions of the incidental take statement, EPA intends to comply with our Endangered Species Act (ESA) section 7(a)(2) obligations for all 28 listed species, and their critical habitat in the same manner.

specifically require a vegetative buffer. Rather, we intend to set the lower limit for the "no use" buffer at 100 feet as described above. While EPA has determined for certain water bodies that it may be possible to account for spray drift concerns with relatively small buffers (i.e., less than 100 feet), We have concluded that a minimum 100 foot no use buffer is necessary to account for potential movement of the pesticide to salmon habitat through both aerial drift and overland runoff. Given the research and resulting literature relative to the effectiveness of vegetative buffers and maintenance thereof, EPA believes the minimum 100 foot application buffer effectively addresses NMFS concern regarding pesticide residues entering salmon and steelhead habitat from ground sources. *(SEE TECHNICAL APPENDIX - SECTION C)*

ITEM #4 - Soil Moisture/48 Hour Storm Restriction: NMFS recommended that EPA require that the pesticide may not be applied when the fields are saturated or when a storm event likely to produce runoff is forecasted by NOAA/NWS, (National Weather Service) to occur within 48 hours after application. EPA intends to require these use limitations as recommended by NMFS.

ITEM #5 - Fish Mortality Incident Reporting Requirement: NMFS recommended that EPA require pesticide users to report all incidents of fish mortality that occur within four days of application and within the vicinity of the treatment area to EPA Office of Pesticide Programs. EPA intends to require that pesticide users report such incidents. However, rather than reporting these incidents to EPA, we intend to require they be reported to the pesticide registrant who is already required to provide information regarding incidents to EPA through a system established under section 6(a)(2) of FIFRA. By approaching incident reporting in this manner, EPA will avoid establishing a secondary system for receipt of such incidents and ensure appropriate treatment of all incidents reported. *(SEE TECHNICAL APPENDIX – SECTION D)*

ITEM #6 - Effectiveness Monitoring Program for Off-channel Habitats: NMFS recommended EPA undertake an effectiveness monitoring program designed to determine whether the provisions in items one through five above are effective at limiting the amount of pesticide residues in the most vulnerable types of salmon and steelhead habitat. NMFS provided very specific parameters for such a monitoring program. We have had discussions with your office and believe that we can work with NMFS to design a reasonable monitoring study which will allow the federal government to determine peak concentrations of the OP pesticides in these vulnerable, off-channel habitats and at the same time provide information and data that might allow EPA to determine the effectiveness of its modeling in determining potential exposures in such habitats. EPA will also seek the input of the U.S. Geological Survey in developing such a protocol with NMFS. Finally, EPA intends to require that the registrants of the OP pesticides fund and conduct the monitoring study once the protocol is developed and that they report the results of the monitoring study to EPA. *(SEE TECHNICAL APPENDIX – SECTION E)*

I will keep you informed as we proceed with implementation of the NMFS November 18, 2008 BiOp as outlined in this letter. Meanwhile, if you have any questions regarding the information contained in this letter please feel free to contact me. I can be reached on (703) 308-8000.

Sincerely,

Richard P Keigwin, Jr

Richard P. Keigwin, Jr., Director
Special Review and Reregistration Division

TECHNICAL APPENDIX

SECTION A – NMFS RPA ITEMS

ITEM #1 - Apply the following no-application buffers/setbacks (buffers):

A. Where ground applications are permitted. Do not apply pesticide products within 500 ft (152. 4 m) of salmonid habitats.

B. Where aerial applications are permitted. Do not apply pesticide products within 1,000 ft (304.8 m) of salmonid habitats.

ITEM #2 - Do not apply when wind speeds are greater than or equal to 10 mph as measured using an anemometer immediately prior to application. When applying pesticide products, commence applications on the side nearest the aquatic habitat and proceed away from the aquatic habitat.

ITEM #3 - For agricultural uses, provide a 20 ft (6.1 m) minimum strip of non-crop vegetation (on which no pesticides shall be applied) on the downhill side of the application site immediately adjacent to any surface waters that have a connection to salmonid-bearing waters. This includes drainage systems that have salmonid exclusion devices, but drain to salmonid-bearing waters.

ITEM #4 - Do not apply pesticide products when soil moisture is at field capacity, or when a storm event likely to produce runoff from the treated area is forecasted by NOAA/NWS, (National Weather Service) to occur within 48 hours following application.

ITEM #5 - Report all incidents of fish mortality that occur within four days of application and within the vicinity of the treatment area to EPA Office of Pesticide Programs (703-305-7695).

ITEM #6 - In addition to the labeling requirements above, EPA shall develop and implement a NMFS-approved effectiveness monitoring plan for off-channel habitats with annual reports. The plan shall identify representative off-channel habitats within agricultural areas prone to drift and runoff of pesticides. The number and locations of off-channel habitat sampling sites shall include currently- used off-channel habitats by threatened and endangered Pacific salmonids identified by NMFS biologists and will include at least two sites for each general species (ESU, DPS) i.e., Coho salmon, chum salmon, steelhead, sockeye salmon, and ocean-type Chinook and stream-type Chinook salmon. Additionally, each state shall have at least three sites within their borders. One site in each state shall target where juvenile ESA-listed salmonids migrate to the Pacific Ocean. The plan shall collect daily surface water samples targeting at least three periods during the application season for seven days. Collected water samples will be analyzed for current-use OPs and carbamates following USGS schedule for analytical chemistry. The report shall be submitted to NMFS OPR and will summarize annual monitoring data and provide all raw data.

SECTION B –Spray Drift Buffers (NMFS RPA Item #1)

> *EPA intends to require differential spray drift buffers adjacent to waters within the range of the listed Pacific salmonids. The extent of such buffers will differ based on three factors: application rate, spray droplet spectrum, and water body size but in no case will be less than 100 feet (see Technical Appendix- Section C below). Except in cases where the limits of the model are reached and therefore predict >1000 foot buffer, such buffers will result in levels of the pesticide in the water body, at no greater than 1.12 ppb for applications conducted using ground equipment or aerial equipment. In those cases where the model predicts a buffer equal to or greater than 1000 feet is necessary to reach 1.12ppb in the water body, EPA intends to impose the 1000 foot buffer regardless of whether application is by ground or air.*

In the November 18, 2008 Biological Opinion (BiOp) completed by NMFS for current registrations of chlorpyrifos, diazinon, and malathion relative to listed Pacific salmonids NMFS proposed a reasonable and prudent alternative (RPA) that specified ground and aerial buffers needed to eliminate likely jeopardy to listed salmon in the PNW states. In this BiOp NMFS used EPA's spray drift model (AgDrift) to specify spray drift buffers below which jeopardy will not occur. The analysis resulted in buffers of 500 feet for all ground applications (regardless of which OP or application rate) and 1,000 feet for aerial applications. These buffers represent one element of the overall RPA (Item #1) proposed by NMFS.

In Table 66 of the BiOp each buffer distance is based exclusively on a use that borders a shallow, vulnerable off-channel habitat. Further, each buffer is associated with a corresponding target pesticide concentration. Therefore, EPA interprets the RPA to be based on these target concentrations and an assumed water body size of 10 meters wide and 0.1 meters deep representing a most vulnerable off-channel habitat and default AgDrift settings (low boom, 50^{th}%, and very fine to fine droplet spectra for ground applications and fine to medium droplet spectra for aerial applications). Furthermore EPA interprets these associated concentrations to be a threshold above which likely jeopardy is expected and below which no jeopardy is expected.

NMFS has then indicated that the 500 ft ground buffer and 1,000 ft aerial buffer should be applied to all salmonid habitat including known occurrences of salmonids and waters that connect to these locations including tributaries, off-channel habitats[1], and ditches/canals. Because the occupied habitat and connected waters in the PNW states vary tremendously in size EPA believes that application of generic buffers would create a scenario in which larger water bodies would be held to a stricter pesticide concentration standard than the most vulnerable habitat evaluated by NMFS (i.e. 10 m wide by 0.1 m deep). For example, 1 lb/acre of any of the three pesticides with a 500 ft ground buffer yields a no-jeopardy threshold of 1.122 ppb in a 10 m x 0.1 m water body, while a 1 lb/acre of any of the three pesticides with a 500 ft buffer in a

[1] As defined by NMFS in the November 18, 2008 OP BiOp examples of off-channel habitat include alcoves, channel edge sloughs, overflow channels, backwaters, terrace tributaries, off-channel dredge ponds, and braids (Anderson 1999; Swift III 1979).

water body of 10 m x 1 m would yield a no-jeopardy concentration of 0.112 ppb. This implies that a different more stringent standard is being applied to larger and by extension less vulnerable water bodies. EPA believes that the target concentrations may be met by first, assuming different water body sizes (varying depth and width in AgDrift) and different application assumptions (droplet size spectra).

In order to address this item EPA intends to establish "bins" of water bodies representing general classes of habitat including off-channel, drainage ditch/canals, and streams/rivers present throughout the PNW states. The "bins" would be based on available data and each bin evaluated represents a percentile of size within each class. The off-channel habitat water body size (10 m wide by 0.1 m deep) would represent the most vulnerable water body as identified by NMFS in the BiOp; however alternate buffers would be established for additional water body sizes in order to represent the distribution of waters throughout the 4 state region -- thereby providing pesticide applicators with alternate spray drift buffers for applications that occur adjacent to larger waters, while still achieving the target concentration for no likely jeopardy of 1.122 ppb.

In order to accomplish this task data were assembled from various sources to provide a distribution of water body sizes for three classes of habitat including off-channel habitats, drainage ditches/canals, and streams and rivers. In all three cases the source of data was limited. Off-channel habitat data were obtained from the State of Washington Department of Fish and Wildlife (WDFW) Technical Applications Division (TAD) Off Channel Inventory. These data represent surveyed off channel habitats from areas adjacent to Puget Sound and Olympic Peninsula. EPA used the Puget Sound data as this set had the more robust description of habitat geometry. A total of 547 individual values were ranked and considered as "bins" for this assessment. Information on drainage conveyances was obtained by accessing the US Bureau of Reclamation's Projects and Facilities database for "Carriage Facilities". These data represent major and minor water conveyances throughout the PNW states and were ranked similarly to the off channel habitat described above. Over 100 individual conveyances were available for analysis. Finally, no data were found that characterized classes of streams and rivers throughout the PNW. However, USGS completed an analysis of Mid Atlantic streams (Moyer and Bennett, 2007) with over 650 individual stream geometries measured from four distinct geomorphic provinces (coastal plain, piedmont, valley and ridge, and Appalachian plateau). Though not specific to the PNW states it is believed that these data provide a suitable surrogate for stream and river geometry in the PNW states which has a similar range of geomorphic provinces.

In all three cases the resulting depth and width information was ranked from smallest to largest and a percentile distribution was created. In order to make the "bins" manageable, EPA intends to limit the off channel "bins" to four bins, including the NMFS scenario and three less vulnerable scenarios (less vulnerable meaning larger volume). Representative, less vulnerable off channel habitat scenarios were selected using professional judgment from these data because the majority of sites were less wide than that assessed by NMFS but most sites were of similar or greater depth. Both the drainage conveyance and stream/river data were "binned" in a systematic fashion with scenarios at the 5^{th}% (or most vulnerable modeled exposure scenario), 25^{th}%, 50^{th}%, and 75^{th}%. An additional 95^{th}% scenario was created for streams and rivers due to the size of some of the main-stem rivers (e.g. Columbia River) flowing through the salmonid ESUs. For the user the associated buffer would be applicable for all waters that are the size of

the scenario and up to the next highest "bin". For instance, a farmer that is applying adjacent to a drainage conveyance that is 15 ft wide and 6 ft deep would use the buffer associated with the 10 ft by 4 ft scenario.

Table 1 summarizes the "bins" derived by EPA from these data. Interestingly NMFS has employed similar "binning" approaches for assessing stream width and habitat measures for rating intrinsic habitat potential for Chinook and steelhead (NMFS 2007).

Table 1 Revised scenarios with percentiles from data sets

Width	Width Percentile Rank from Data Source	Depth	Depth Percentile Rank from Data Source
NMFS Off Channel Scenario			
10 m (32.8 ft)	98%[1]	0.1 m (0.33 ft)	25%
Additional Off channel Scenarios (WDFW)[2]			
10 m (32.8 ft)	98%	0.15 (0.49 ft)	50%
10 m (32.8 ft)	98%	0.2 (0.66 ft)	75%
10 m (32.8 ft)	98%	1 (3.3 ft)	95%
Drainage ditch/canal (BOR)[3]			
4 ft	5%	2 ft	5%
10 ft	25%	4 ft	25%
18 ft	50%	7 ft	50%
34 ft	75%	10 ft	75%
Streams/rivers (USGS)[4]			
35 ft	5%	5 ft	5%
60 ft	25%	6 ft	25%
90 ft	50%	7 ft	50%
155 ft	75%	10 ft	75%
550 ft	95%	20 ft	95%

1 – Percentile derived using all data including values lower than those considered by NMFS. The percentile of the 10 m wide habitat using only values equal to or greater than the NMFS assumption would be 25th%. The depth percentiles are unaffected by screening at 0.1 m deep because most data are of equal or greater value.
2 – Off channel attributes of depth and width derived from Washington Department of Fish and Wildlife (WDFW) Technical Applications Division (TAD) off-Channel Habitat Inventories. http://wdfw.wa.gov/hab/tapps/off_channel/db/off_channel_download.htm
3 – Irrigation conveyance attributes of depth and width derived from Bureau of Reclamation Projects and Facilities Database on "Carriage Facilities". http://www.usbr.gov/projects/index.jsp
4 – Stream and River attributes of depth and width derived from USGS Scientific Investigations Report 2007 – 5135. Moyer, D.L., and Bennett, M.R., 2007, Development of relations of stream stage to channel geometry and discharge for stream segments simulated with Hydrologic Simulation Program–Fortran (HSPF), Chesapeake Bay Watershed and adjacent parts of Virginia, Maryland, and Delaware: U.S. Geological Survey Scientific Investigations Report 2007–5135, 83 p. http://pubs.usgs.gov/sir/2007/5135/

In order to put these "bins" into context, comparison was made with several salmonid-relevant habitats in the PNW states. For instance, the Marion Drain is a known irrigation return conveyance that connects directly to the Yakima River in central Washington and has been observed to have occasional salmonids present in its lower reaches. The Marion Drain is roughly 30 to 50 feet wide at points and would fit into the larger drainage ditch/canal "bin" described above. Similarly, the Yakima River located in the same general area can be up to 100 to 200 feet wide while the Columbia River and Sacramento River can exceed 500 feet. Though not exhaustive, this comparison confirms the variable nature of drainage conveyances and streams/rivers and the need for alterative buffers where pesticides may be applied adjacent to these larger habitats. Interestingly NMFS appears to have assigned a lower threshold for habitat suitability in the 2 m to 3 m range (NMFS 2007).

NMFS' analysis in the BiOp used the Tier I component of AgDrift and assumed a water body of 10 meters wide and 0.1 meters deep (inherent in AgDrift is an assumption that the length is 515.8 ft, or the equivalent of the edge of field for the EPA model pond and wetland). EPA modeled spray drift for a number of aquatic scenarios using AgDRIFT, v 2.01. Using the Tier I aerial and Tier I ground scenarios, EPA evaluated the buffer zones required for various receiving water bodies using the 1.122 ppb target concentration for both ground and aerial because NMFS' jeopardy analysis appears to indicate that achieving this lower concentration is necessary to be sufficiently protective. For the Tier I ground applications, EPA assessed buffer zones for a low boom, ASAE Very Fine to Fine droplet size distributions at the 50^{th}% as modeled by NMFS. In addition, EPA modeled alternative Tier I AgDrift runs using the Fine to Medium/Coarse droplet size distributions for ground applications. For Tier I aerial applications, EPA assessed buffer zones for ASAE Fine to Medium droplet size distributions as modeled by NMFS along with alternative settings using the Medium to Coarse, and Coarse to Very Coarse droplet size distributions. Application rates ranged from 1 to 15 lbs ai/acre in order to fully characterize the range of current uses.

Results of the analysis are presented in the following tables. Table 2 presents a summary of the range of registered application rates (in 1 lb ai/acre increments) for ground applications in various water body geometries using the NMFS default AgDrift assumptions. Table 3 presents the same analysis for aerial applications. Table 4 presents the ground applications across the same spectrum of application rates and water body geometries but assumes a coarser droplet size spectra (ASAE medium to coarse). Table 5 presents an alternative to the NMFS AgDrift assumptions for aerial applications assuming a medium to coarse droplet spectra and Table 6 presents spray drift distances for aerial applications using a coarse to very coarse spectra.

The analysis presented in Tables 2 and 4 indicates that for ground applications the incorporation of varying water body sizes and alternative droplet spectra significantly reduces the overall size of the spray drift buffers for all aquatic habitats except the smallest off channel habitats (generally those less than 1 meter deep) and at the higher application rates (generally greater than 4 to 5 lbs ai/acre). However, for aerial applications the analysis presented in Tables 3, 5, and 6 suggest that the impact of the alternatives evaluated is less significant except for the larger water body sizes (generally greater than 10 to 20 feet wide and 4 to 7 feet deep) and lower application rates (generally less than 3 to 4 lbs ai/acre).

Overall, the analysis suggests that one possible approach to reduce loading in salmonid bearing waters is to limit applications in the vicinity of these water to ground applications. This could prove to be a reasonable and economically less significant approach given that for the majority of uses the current application rates are on the low end of those assessed here with chlorpyrifos and diazinon application rates less than 4 lbs ai/acre for all uses.

In order to facilitate the transparency of this analysis for the end user EPA intends to create a web based program that will allow the user to input the specifics of the planned application and provide the relevant spray drift buffer. This application would be accessible to the user via the EPA's Endangered Species Protection Bulletins through the *Bulletins Live*! application at www.epa.gov/espp.

Table 2 Summary of Alternate Spray Drift Buffers for NMFS Reasonable and Prudent Alternative (RPA) Item #1 Assuming Target Concentration of 1.122 ppb and NMFS Default AgDrift Assumptions for Ground Applications[1]																	
App Type	Width	Depth	Buffer Width (ft)[2]														
			Application Rate (lbs ai/acre)														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
NMFS Assumption for Off-channel Habitat																	
Ground	32. 8 ft (10 m)	0. 33 ft (0.1 m)	500	975	1000[3]	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Alternate Assumptions for Off Channel Habitat																	
Ground	32. 8 ft (10 m)	0. 49 ft (0.15 m)	325	675	975	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Ground	32. 8 ft (10 m)	0. 66 ft (0.2 m)	225	500	750	950	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Ground	32. 8 ft (10 m)	3.28 ft (1 m)	25[4]	75	125	175	225	300	350	400	450	500	550	600	650	700	750
Alternate Assumptions of Irrigation Canals and Ditches																	
Ground	4 ft	2 ft	75	150	250	325	425	500	600	675	750	825	900	975	1000	1000	1000
Ground	10 ft	4 ft	25	75	100	150	200	250	300	325	375	425	450	500	550	600	625
Ground	18 ft	7 ft	25	25	50	75	100	125	150	175	200	225	250	275	300	325	350
Ground	34 ft	10 ft	25	25	25	50	50	75	100	100	125	150	150	175	200	225	225
Alternate Assumptions for Streams and Rivers																	
Ground	35 ft	5 ft	25	50	75	100	150	175	225	250	275	325	350	400	425	450	500
Ground	60 ft	6 ft	25	25	50	75	100	125	150	200	225	250	275	300	350	375	400
Ground	90 ft	7 ft	0	25	25	50	75	100	125	150	175	200	225	250	275	300	325
Ground	155 ft	10 ft	0	0	0	25	25	50	50	50	75	100	100	125	150	150	175
Ground	550 ft	20 ft	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1 – NMFS AgDrift Assumptions - Ground = ASAE very fine to fine droplet spectra, low boom, 50th percentile output.
2 – Buffer widths have been rounded to the nearest 25 ft interval
3 – Yellow highlighted buffers of 1,000 ft represents the upper limit of AgDrift in Tier I mode
4 – Blue highlighted buffers represent distances less than the 100 ft spray drift minimum threshold specified in Item 3. EPA intends to set these to 100 ft for the end user in order to appropriately address runoff potential

Table 3 Summary of Alternate Spray Drift Buffers for NMFS Reasonable and Prudent Alternative (RPA) Item #1 Assuming Target Concentration of 1.122 ppb and NMFS Default AgDrift Assumption for Aerial Applications[1]																	
App Type	Width	Depth	Buffer Width (ft)[2]														
			Application Rate (lbs ai/acre)														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
NMFS Assumption for Off-channel Habitat																	
Aerial	32. 8 ft (10 m)	0. 33 ft (0.1 m)	1000[3]	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Alternate Assumptions for Off Channel Habitat																	
Aerial	32. 8 ft (10 m)	0. 49 ft (0.15 m)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Aerial	32. 8 ft (10 m)	0. 66 ft (0.15 m)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Aerial	32. 8 ft (10 m)	3.28 ft (1 m)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Alternate Assumptions of Irrigation Canals and Ditches																	
Aerial	4 ft	2 ft	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Aerial	10 ft	4 ft	925	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Aerial	18 ft	7 ft	450	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Aerial	34 ft	10 ft	300	650	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Alternate Assumptions for Streams and Rivers																	
Aerial	35 ft	5 ft	650	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Aerial	60 ft	6 ft	500	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Aerial	90 ft	7 ft	400	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Aerial	155 ft	10 ft	225	584	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Aerial	550 ft	20 ft	25[4]	125	250	425	675	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

1 – NMFS AgDrift Assumptions - Ground = ASAE very fine to fine droplet spectra, low boom, 50th percentile output. Aerial = ASAE fine to medium droplet spectra.

2 – Buffer widths have been rounded to the nearest 25 ft interval

3 – Yellow highlighted buffers of 1,000 ft represents the upper limit of AgDrift in Tier I mode

4 – Blue highlighted buffers represent distances less than the 100 ft spray drift minimum threshold specified in Item 3. EPA intends to set these to 100 ft for the end user to appropriately address runoff potential

Table 4 Summary of Alternate Spray Drift Buffers for NMFS Reasonable and Prudent Alternative (RPA) Item #1 Assuming Target Concentration of 1.122 ppb for Ground Applications and Using Alternative AgDrift Assumptions[1]																	
App Type	Width	Depth	Buffer Width (ft)[2]														
			Application Rate (lbs ai/acre)														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
NMFS Assumption for Off-channel Habitat																	
Ground	32. 8 ft (10 m)	0.33 ft (0.1 m)	250	550	827	1000[3]	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Alternate Assumptions for Off Channel Habitat																	
Ground	32. 8 ft (10 m)	0.49 ft (0.15 m)	175	375	575	750	925	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Ground	32. 8 ft (10 m)	0.66 ft (0.2 m)	125	250	425	550	700	825	950	1000	1000	1000	1000	1000	1000	1000	1000
Ground	32. 8 ft (10 m)	3.28 ft (1 m)	25[4]	25	50	75	125	150	175	200	225	275	300	325	350	400	425
Alternate Assumptions of Irrigation Canals and Ditches																	
Ground	4 ft	2 ft	25	75	125	175	225	275	325	375	425	475	525	575	625	650	700
Ground	10 ft	4 ft	25	25	50	75	100	125	150	175	200	225	250	275	300	325	350
Ground	18 ft	7 ft	0	25	25	25	50	50	75	75	100	100	125	150	150	175	175
Ground	34 ft	10 ft	0	0	0	25	25	25	25	50	50	50	75	75	100	100	108
Alternate Assumptions for Streams and Rivers																	
Ground	35 ft	5 ft	0	25	25	50	50	75	100	125	125	150	175	200	225	250	250
Ground	60 ft	6 ft	0	0	25	25	25	50	75	75	100	100	125	150	175	175	200
Ground	90 ft	7 ft	0	0	0	25	25	25	50	50	75	75	100	100	125	125	150
Ground	155 ft	10 ft	0	0	0	0	3	0	0	25	25	25	25	25	50	50	50
Ground	550 ft	20 ft	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1 – AgDrift Assumptions - Ground = ASAE fine to medium/coarse droplet spectra, low boom, 50th percentile output.

2 – Buffer widths have been rounded to the nearest 25 ft interval

3 – Yellow highlighted buffers of 1,000 ft represents the upper limit of AgDrift in Tier I mode

4 – Blue highlighted buffers represent distances less than the 100 ft spray drift minimum threshold specified in Item 3. EPA intends to set these to 100 ft for the end user to appropriately address runoff potential.

Table 5 Summary of Alternate Spray Drift Buffers for NMFS Reasonable and Prudent Alternative (RPA) Item #1 Assuming Target Concentration of 1.122 ppb for Aerial Applications and Using Alternative AgDrift Assumptions[1]																	
App Type	Width	Depth	Buffer Width (ft)[2]														
			Application Rate (lbs ai/acre)														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
NMFS Assumption for Off-channel Habitat																	
aerial	32. 8 ft (10 m)	0.33 ft (0.1 m)	1000[3]	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Alternate Assumptions for Off Channel Habitat																	
aerial	32. 8 ft (10 m)	0.49 ft (0.15 m)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
aerial	32. 8 ft (10 m)	0.66 ft (0.2 m)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
aerial	32. 8 ft (10 m)	3.28 ft (1 m)	425	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Alternate Assumptions of Irrigation Canals and Ditches																	
aerial	4 ft	2 ft	825	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
aerial	10 ft	4 ft	350	825	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
aerial	18 ft	7 ft	225	400	650	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
aerial	34 ft	10 ft	150	275	425	600	825	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Alternate Assumptions for Streams and Rivers																	
aerial	35 ft	5 ft	275	600	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
aerial	60 ft	6 ft	225	450	800	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
aerial	90 ft	7 ft	175	375	625	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
aerial	155 ft	10 ft	100	225	350	525	775	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
aerial	550 ft	20 ft	0[4]	25	75	125	175	225	300	375	475	600	725	875	1000	1000	1000

1 – AgDrift Assumptions - Aerial = ASAE medium to coarse droplet spectra.
2 – Buffer widths have been rounded to the nearest 25 ft interval
3 – Yellow highlighted buffers of 1,000 ft represents the upper limit of AgDrift in Tier I mode
4 – Blue highlighted buffers represent distances less than the 100 ft spray drift minimum threshold specified in Item 3. EPA intends to set these to 100 ft for the end user to appropriately address runoff potential

Table 6 Summary of Alternate Spray Drift Buffers for NMFS Reasonable and Prudent Alternative (RPA) Item #1 Assuming Target Concentration of 1.122 ppb for Aerial Applications and Using Alternative AgDrift Assumptions[1]																	
App Type	Width	Depth	Buffer Width (ft)[2]														
			Application Rate (lbs ai/acre)														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
NMFS Assumption for Off-channel Habitat																	
aerial	32. 8 ft (10 m)	0.33 ft (0.1 m)	1000[3]	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Alternate Assumptions for Off Channel Habitat																	
aerial	32. 8 ft (10 m)	0.49 ft (0.15 m)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
aerial	32. 8 ft (10 m)	0.66 ft (0.2 m)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
aerial	32. 8 ft (10 m)	3.28 ft (1 m)	250	525	825	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Alternate Assumptions of Irrigation Canals and Ditches																	
aerial	4 ft	2 ft	450	950	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
aerial	10 ft	4 ft	225	450	675	950	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
aerial	18 ft	7 ft	150	250	3765	500	625	775	950	1000	1000	1000	1000	1000	1000	1000	1000
aerial	34 ft	10 ft	100	175	250	350	450	525	600	700	800	950	1000	1000	1000	1000	1000
Alternate Assumptions for Streams and Rivers																	
aerial	35 ft	5 ft	175	350	525	700	950	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
aerial	60 ft	6 ft	150	275	425	575	725	925	1000	1000	1000	1000	1000	1000	1000	1000	1000
aerial	90 ft	7 ft	125	225	350	475	600	725	900	1000	1000	1000	1000	1000	1000	1000	1000
aerial	155 ft	10 ft	50[4]	125	200	300	375	475	550	650	750	875	1000	1000	1000	1000	1000
aerial	550 ft	20 ft	0	0	25	50	75	100	125	175	200	225	275	300	350	400	450

1 –AgDrift Assumptions - Aerial = ASAE coarse to very coarse droplet spectra.
2 – Buffer widths have been rounded to the nearest 25 ft interval
3 – Yellow highlighted buffers of 1,000 ft represents the upper limit of AgDrift in Tier I mode
4 – Blue highlighted buffers represent distances less than the 100 ft spray drift minimum threshold specified in Item 3. EPA intends to set these to 100 ft for the end user to appropriately address runoff potential.

SECTION C – Non-cropped Vegetative Runoff Buffer (NMFS RPA Item #3)

EPA does not intend to specifically require a vegetative buffer. Rather, we intend to impose a buffer of no less than 100 feet adjacent to water bodies relevant to Pacific salmon and steelhead, to account for potential movement of the pesticide to salmon habitat through both aerial drift and overland runoff. Based on the NMFS definition of waters to which use limitations are applicable, the 100 foot minimum buffer would also apply around any channelization extending from a field to flowing water within the geographic area depicted by the range maps. Given the research and resulting literature relative to the effectiveness of vegetative buffers and maintenance thereof, EPA believes the minimum 100 foot buffer adjacent to salmon habitat and any channelization leading to salmon habitat effectively addresses NMFS concern regarding pesticide residues entering such habitats from air and ground sources.

NMFS proposed as an element of the RPA that a non-cropped vegetative buffer of 20 feet should be established on the downhill side of an application site adjacent to water bodies. As noted in the text NMFS describes this zone as a strip of "non-cropped vegetation" which EPA interprets to mean any vegetated buffer including vegetated filter strips (VFS), land in the Conservation Reserve Program (CRP), managed grassed strips, and all forms of natural riparian buffers with the exception of bare soil. An underlying assumption of this element of the RPA as proposed by NMFS, appears to be that the buffers specified in Item #1 will reduce pesticide loading to surface waters from both drift and runoff principally due to the size of the buffers (see page 394 of NMFS BiOp) and that the 20 feet buffer adds confidence to this assumption. For the most part, many areas in the PNW states covered by the RPA meet these criteria. Pesticide loading to surface waters occurs through a combination of spray drift and runoff (transporting both dissolved and suspended phase pesticide). Spray drift buffers have been addressed in Item #1 of the RPA. In this section EPA outlines its approach for addressing the runoff portion of pesticide loading.

Most research suggests that runoff buffers similar to the NMFS proposed 20 ft buffer are not as effective at reducing runoff loading to surface waters relative to larger buffers. While this is not a significant issue when the 20 ft non cropped vegetative buffer is coupled with a 500 ft or 1,000 ft spray drift buffer it does raise concerns about the potential for runoff loading to surface water as the buffer decreases in size as described in EPA's approach to NMFS RPA Item #1. Second, many portions of the PNW cannot support non-cropped buffer zones due to the arid nature of the region, the need for extensive infrastructure to irrigate and maintain such a buffer, and increasing requirements by states and food processors for bare soil buffers to deal with concerns over e-coli. Finally, the effectiveness of the buffer is contingent upon a program of maintenance (VFS, riparian or CRP) to prevent channelization and ultimate bypass of the buffer by concentrated flow.

In order to address these issues, EPA is establishing a minimum spray drift buffer below which it is expected that runoff will not be a significant contributor to pesticide loading to surface water habitats relative to the target concentration of 1.122 ppb. For this item, EPA is proposing that no spray drift buffer described in Item #1 will be smaller than 100 feet and that these buffers will be applicable to any water within an ESU/DPS that meets the NMFS description of relevant waters. In addition, EPA intends to require that the 100 foot distance apply to any channelized flow that drains into salmonid habitat water as described by NMFS. This minimum distance has been incorporated into EPA's approach to NMFS RPA Item #1 (Tables 2 through 6 above).

To establish this threshold distance, EPA has conducted an evaluation of available open literature on the effectiveness of runoff buffers at removing pesticide loading to surface waters. The goal of this effort is not to establish a default runoff buffer for all OPP risk assessments but to find a minimum threshold below which overland runoff for any land cover condition would not be expected to result in more than 1.122 ppb in salmon habitat for the specific pesticides addressed in this BiOp. By determining this threshold, EPA would limit the allowable spray drift buffer adjacent to all the applicable waters within the geographic scope of the ESU/DPS's addressed.

Numerous studies are available in the open literature documenting the effectiveness of vegetative buffers on runoff reduction. The principal example of this research is the USDA's "Conservation Buffers to Reduce Pesticide Losses" (USDA 2000) which was specifically developed to address potential impact of vegetative buffers to reduce pesticide loading. In this analysis, the authors made no specific recommendation but suggest that in order to be effective a buffer must be at least 100 feet wide to reduce dissolved pesticide and nutrient loading and 20 feet to reduce sediment loading. An important caveat on this work (which focused primarily on VFS) is that the buffer must be well managed and not allowed to channelize. Research indicates that as a buffer becomes channelized the effectiveness at pesticide runoff reduction can quickly be eliminated.

A significant amount of research has been summarized documenting the effectiveness of non- VFS buffers at removing both dissolved and sediment bound contaminants. While much of this research is focused on phosphorous and nutrient loading the data do include evidence of the effectiveness of these non-VFS buffers at removing pesticides. Much of the more recent work has focused on natural riparian buffers as a tool to reduce loadings in both agricultural and forestry settings. Of particular interest is the work done by USDA Natural Resources Conservation Service (NRCS) under the Conservation Reserve Program (CRP). In general, the CRP recommends buffers between 35 and 180 feet and suggests that these buffers follow the three zone approach (Welsch, 1991). Numerous states have adopted this approach for describing buffers appropriate for use as part of the CRP. Similar recommendations have been made by the USDA Forest Service (FS) for the Chesapeake Bay Program (CBP, 1995, Palone and Todd, 2002). In all cases these programs recommend a maintenance effort to reduce the amount of channelized flow through these zones; however, for natural riparian systems these maintenance methods are focused on maintenance of the natural condition with periodic removal of trees (USDA, NRCS, 1998).

Additional research is consistent with the recommendations from the USDA NRCS CRP work. In 2005 the USEPA ORD's Ada Laboratory (Mayer et al, 2006) published a report synthesizing the results of numerous studies on nitrogen removal efficiencies and found that for all studies runoff buffers would need to be 3 meters to reduce 50% of loading and up to 112 meters to reduce 90% of loading. Similar reports synthesizing available open literature data were prepared by the Agro Forestry Division of USDA (USDA 2004) and the USGS Playa Lakes Joint Venture (Melcher and Skagen 2005). The USDA created a nomograph based on available data and the VSFMOD model (a runoff buffer model currently under evaluation, among others, by EPA) that allows for estimation of removal efficiencies. For example, in this work the USDA estimates a 20 meter buffer will reduce sediment loads by 70%, while sediment bound phosphorus will be reduced by 50% and dissolved nitrate by 25%. In the USGS report the authors estimate that buffers must be generally between 10 and 60 meters to be effective. Also, several state specific examples were reviewed including a synthesis on research of buffer effectiveness near wetlands by Washington State (WA State, 2005) and a synthesis by the Connecticut Association of Wetland Scientists (CT CAWS, 2004). Washington State concluded that for reducing loading of coarse sediment to wetlands a buffer of 5 to 20 meters was needed, while for finer sediment loading the buffer should be between 20 and 100 meters and for dissolved nutrients

the buffers should be between 5 and 40 meters. The CAWS study made a general recommendation that buffers should be a minimum of 5 meters for low slopes (< 10% slope) and 10 meters for high slopes (>10% slope). Additional research provides a consistent picture of the effectiveness of both managed VFS and more natural riparian type buffers with recommended buffers typically between 50 feet and 150 feet (Agro forestry Notes, AF Note – 4, Liu and Yang, 2007, Reichenberger et al, 2007, Wenger 1999, Palone and Todd, 2002, Hawes and Smith, 2005).

Although variable in results, the studies above do present a somewhat consistent picture suggesting that for dissolved pesticide loading a spray drift buffer should be no less than 100 feet wide in order to be effective at removing most of the dissolved pesticide and that a smaller buffer width of no less than 50 feet should be effective at reducing pesticide loading with sediment. In general, and based on the available literature and best professional judgment, the 100 foot buffer should be reasonably effective at limiting loading from runoff in areas meeting the NMFS definition of waters covered by the BiOp. Channelized flow will negate the effectiveness of any buffer regardless of whether it is the 20 ft non-cropped vegetation zone or the no spray threshold zone. Therefore, for areas where channelized flow occurs, a setback distance of 100 ft representing the minimum spray drift distance should also be applied to the area where the channelization first appears in the buffer.

Until such time as EPA develops a quantitative methodology for predicting runoff buffer efficiency these numbers are considered relevant only to the specifics being addressed in this analysis. EPA will continue to evaluate spray drift and runoff buffer implementation on a case by case basis incorporating an understanding of each pesticides use pattern and fate and transport properties as well as eco-toxicological profile.

REFERENCES FOR ITEM #3

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SECTION D –Fish Mortality Incident Reporting (NMFS RPA Item #5)

EPA intends to require that registrants of any pesticide whose active ingredients include one of the three OP pesticides, treat reported incidents involving fish from use of their pesticide in CA, OR, WA or ID, as individual reportable incidents under FIFRA section 6(a)(2) with a requirement that such incidents be reported to EPA within 15 days of the registrant learning of the alleged incident. EPA also intends to require through pesticide labeling that pesticide applicators report any fish kills of which they are aware to have occurred within or adjacent to the treatment area, and which occurred within four days of treatment, to the pesticide registrant of the product that was used.

In the November 18, 2008, Biological Opinion (BiOp) completed by NMFS for current registrations of chlorpyrifos, diazinon and malathion relative to listed Pacific salmonids NMFS proposed a reasonable and prudent alternative (RPA) that specified EPA should require pesticide users to "report all incidents of fish mortality that occur within four days of application and within the vicinity of the treatment area to EPA Office of Pesticide Programs (703-305-7695)." In discussions with NMFS regarding this item of the RPA, NMFS expressed that the means of obtaining such incident information was not as critical as actually obtaining relatively "real-time" information. Further, NMFS clarified what was meant by "vicinity" in the context of this item and provided in a July 2, 2009 e-mail, that vicinity means "in surface waters within and adjacent to application areas."

In order to ensure appropriate handling of fish incident information relative to the use of the 3 OP pesticides in CA, OR, WA and ID, and to ensure federal resources are not spent putting in place duplicative processes, it is EPA's intent to require that individual incidents be reported to EPA's FIFRA §6(a)(2) incident system. EPA has several options to accomplish this including requiring such reporting as a condition of registration or utilizing its existing FIFRA §6(a)(2) procedures to ensure timely knowledge of alleged incidents. FIFRA §6(a)(2) requires pesticide registrants to submit to the Agency, additional factual information regarding unreasonable adverse effects on the environment. EPA's regulations at 40 CFR Part 159 limit routine reporting of incidents to the types of information EPA determined were most likely to be significant. However, 40 CFR §159.195(c) requires submission of additional adverse effects information if the registrant has been informed by EPA that such additional information has the potential to raise questions about the continued registration of a product or about the appropriate terms and conditions of registration of a product. After review of the NMFS November 18, 2008, BiOp, additional information regarding fish incidents associated with the use of pesticides containing any of the three OP pesticides has potential to raise questions about the appropriate terms and conditions of registration of such products. As a result, EPA intends to require that registrants of pesticides whose active ingredients include chlorpyrifos, diazinon or malathion, treat reported incidents to fish from use of their pesticide in CA, OR, WA and ID, as individual reportable incidents (non-aggregated) under FIFRA section 6(a)(2) and that such incidents be reported within 15 days of the registrant learning of the alleged incident. Further, EPA intends to require that the labeling of such products carry a statement that would compel the pesticide user within the geographic scope addressed by the BiOp to report such incidents that occur within or adjacent to the treatment area, and which occur within four days of treatment, to the pesticide registrant of the product that was used.

SECTION E –Effectiveness Monitoring Program for Off-Channel Habitats (NMFS RPA Item 6)

> *EPA will work with NMFS, and will seek input from the U.S. Geological Survey, to design a reasonable monitoring study which will allow the federal government to determine peak concentrations of the OP pesticides in off-channel habitat and will provide information and data that might allow EPA to forego monitoring each and every time mitigation is recommended relative to concentrations of pesticides in water and particularly in off-channel habitat. EPA intends to require for products containing any of the three OP pesticides, the registrants fund and conduct the monitoring study once the protocol is approved and that results of the monitoring study be reported to EPA.*

From discussions with NMFS it appears the interest in this item is to determine whether the measures in the BiOp are serving to ensure certain levels are not attained in off-channel habitats by measuring for peak concentrations. Recent discussions with NMFS resulted in agreement to work with EPA to define a monitoring approach that would achieve this objective while at the same time providing information and data that might be used by EPA to forego monitoring each and every time mitigation is recommended relative to concentrations of a pesticide in water.

To meet this need, OPP proposes to develop with NMFS and with input from the U.S. Geological Survey, a more modest monitoring program that would achieve the result of determining peak concentrations in off-channel habitat but also would show how accurately EPA modeling predicts environmental concentrations in off-channel habitat by measuring peak exposures in such habitats and comparing them to predicted estimated environmental concentrations predicted through modeling. Such “calibrations” would result in a better ability to rely on modeling in the future for the remainder of the salmonid assessments and in addition enhance assessment methods for other aquatic species that rely on these types of habitat throughout the country. OPP intends to impose on the registrants the obligation to fund and conduct such monitoring.