Appendix A. Uses Patterns for Carbaryl Used Estimation of Risk to the California Red-Legged Frog

The following table lists the maximum application rate for carbaryl identified for each use site to which carbaryl can be applied. As many of the application practices and use sites are similar, use sites have been place in groups with one use pattern serving as a surrogate for all the other crops in the group. That single crop was the simulated for the aquatic exposure assessment and serves to represent all the crops in the crop group. For terrestrial assessments, use site or 'scenario' is not considered in the assessment, so crop groups which have used different scenarios, but had the same carbaryl maximum application pattern have been place in combined groups for terrestrial assessment. These larger groupings are denoted by the crop group code in brackets, [], if they are different than the grouping for aquatic exposure assessment in Table A-1. For the spray drift assessment, only the single application rate and the application method (aerial, spray blast, or ground spray) are considered. So the groupings can be larger still. Groups for the spray drift assessment are denoted with parentheses in Table A-1 if they are different than those used for terrestrial assessment. Specific justifications for the use of surrogates for each crop are in the narrative below the table.

Crops in Group AR are those crops that have carbaryl use patterns but were not considered in the assessment for the California Red-Legged Frog. The reasons for not considering the use pattern included: the crop was not grown in California (*e.g.* cranberries, soybeans), the use of carbaryl was restricted from use in California (*e.g.* wheat, proso millet), and the use pattern could not be resolved to pounds per acre use rate (*e.g.* transplants). Specific reasons for not considering each use pattern are in the narratives for crop following the table.

Table A-1. Maximum label practices for carbaryl for assessing risks to the California Red Legged Frog.

Crop	Crop Group	Maximum App. Rate (lb a.i./acre)	Maximum Number of Apps.	Max. Seasonal Rate (lb-a.i./acre)	Application Intervals (days)	Application Method
Home lawn	A	9.1	2	NS	7	ground
Fire ants	A	7.4[1]	2	NS	7	ground
Flower beds around buildings[2]	B	8	None	AN	NS	Drop/broadcast spreader
Lawns	B	8	2	8	7	ground
Recreation areas	B	8	2	8	7	ground
Golf courses	B	8	2	8	7	ground
Sod Farms	B	8	2	8	7	ground
Commercial lawns	B	8	2	8	7	ground

Table A-1. Maximum label practices for carbaryl for assessing risks to the California Red Legged Frog.

Crop	Crop Group	Maximum App. Rate (lb a.i./acre)	Maximum Number of Apps.	Max. Seasonal Rate (lb-a.i./acre)	Application Intervals (days)	Application Method
Lawns[5]	C [B](B)	7.8	4	NS	7	ground
Parks	E(B)	8	1	8	NA	ground
Citrus 1	F1	7.5	8	20	14	aerial
Citrus 2	F2	16	1	NS	NA	aerial
Olives	G	7.5	2	15	14	aerial
Almonds	H	5	4	15	7	aerial
Chestnuts	H	5	4	15	7	aerial
Pecans	H	5	4	15	7	aerial
Filberts	H	5	4	15	7	aerial
Walnuts	H	5	4	15	7	aerial
Pistachio[4]	H	5	4	15	7	aerial
Flowers	I	4.3	3	NS	7	ground
Shrubs	I	4.3	3	NS	7	ground
Apricot	J	4 (5 dormant	3 + 1 dormant	9 + 5 for dormant	15	aerial
Cherries	J	4 (5 dormant)	3 + 1 dormant	9 + 5 for dormant	15	aerial
Nectarines	J	4 (5 dormant)	3 + 1 dormant	9 + 5 for dormant	15	aerial
Peaches	J	4 (5 dormant)	3 + 1 dormant	9 + 5 for dormant	15	aerial
Plums	J	4 (5 dormant)	3 + 1 dormant	9 + 5 for dormant	15	aerial
Prunes	J	4 (5 dormant)	3 + 1 dormant	9 + 5 for dormant	15	aerial
Asparagus	K	Pre: 2 Post: 4	Pre:3 Post: 2	Pre: 6 Post: 4	Pre:3 Post: 7	aerial
Apple	L	3	8	7	14	aerial
Pear	L	3	8	7	14	aerial
Crabapple	L	3	8	7	14	aerial
Oriental pears	L	3	8	7	14	aerial
Loquat	M [L](L)	3	8	7	14	aerial
Sweet corn	N	2	8	16	3	aerial
“Caneberries”	O	2	5	10	7	aerial
Blueberries	O	2	5	10	7	aerial
Grapes	O	2	5	10	7	aerial
Strawberries	P[O](O)	2	5	10	7	aerial

Table A-1. Maximum label practices for carbaryl for assessing risks to the California Red Legged Frog.

Crop	Crop Group	Maximum App. Rate (lb a.i./acre)	Maximum Number of Apps.	Max. Seasonal Rate (lb-a.i./acre)	Application Intervals (days)	Application Method
Tomatoes	Q(O)	2	7	8	7	aerial
Peppers	Q(O)	2	7	8	7	aerial
Eggplant	Q(O)	2	7	8	7	aerial
Peanuts	R[Q] (O)	2	5	8	7	aerial
Broccoli	S(O)	2	4	7	6	aerial
Cauliflower	S(O)	2	4	7	6	aerial
Cabbage	S(O)	2	4	7	6	aerial
Kohlrabi	S(O)	2	4	7	6	aerial
Chinese cabbage	S(O)	2	4	7	6	aerial
Collards	S(O)	2	4	7	6	aerial
Kale	S(O)	2	4	7	6	aerial
Mustard greens	S(O)	2	4	7	6	aerial
Brussels sprouts	T[S](O)	2	4	7	6	aerial
Hanover salad	T[S](O)	2	4	7	6	aerial
Sweet potato	U(O)	2	8	8	7	aerial
Field corn	V(U)(O)	2	4	8	14	aerial
Popcorn	V(U)(O)	2	4	8	14	aerial
Lettuce, head	W(O)	2	5	6	7	aerial
Lettuce, leaf	W(O)	2	5	6	7	aerial
Dandelion	W(O)	2	5	6	7	aerial
Endive	W(O)	2	5	6	7	aerial
Parsley	W(O)	2	5	6	7	aerial
Spinach	W(O)	2	5	6	7	aerial
Swiss chard	W(O)	2	5	6	7	aerial
Sorghum	X(O)	2	4	6	7	aerial
Celery	Y[X](O)	2	6	6	7	aerial
Prickly pear	Y[X](O)	2	AN	6	7	ground
Garden beets	Y[X](O)	2	6	6	7	aerial
Carrots	Y[X](O)	2	6	6	7	aerial
Horseradish	Z [X](O)	2	6	6	7	aerial
Parsnip	AA[X](O)	2	6	6	7	aerial
Rutabaga	AA[X](O)	2	6	6	7	aerial

Table A-1. Maximum label practices for carbaryl for assessing risks to the California Red Legged Frog.

Crop	Crop Group	Maximum App. Rate (lb a.i./acre)	Maximum Number of Apps.	Max. Seasonal Rate (lb-a.i./acre)	Application Intervals (days)	Application Method
Potato	AA[X](O)	2	6	6	7	aerial
Salsify	AA[X](O)	2	6	6	7	aerial
Turnip, root	AA[X](O)	2	6	6	7	aerial
Radish	AB[X](O)	2	6	6	7	aerial
Rice	AC	1.5	2	4	7	aerial
“Fresh” beans	AD(AC)	1.5	4	6	7	aerial
Dry beans	AD(AC)	1.5	4	6	7	aerial
Fresh peas	AD(AC)	1.5	4	6	7	aerial
Dry peas	AD(AC)	1.5	4	6	7	aerial
Cowpeas	AD(AC)	1.5	4	6	7	aerial
Southern peas, fresh	AD(AC)	1.5	4	6	7	aerial
Okra	AE	1.5	AN	6	6	ground
Sugar beet	AF(AE)	1.5	2	3	14	aerial
Alfalfa	AG(AE)	1.5	1/cutting	NS	NA	aerial
Birdsfoot Trefoil	AG(AE)	1.5	1/cutting	NS	NA	aerial
Clover	AG(AE)	1.5	1/cutting	NS	NA	aerial
Pasture	AH(AE)	1.5	2	3	14	aerial
Grass for seed	AI [AH] (AC)	1.5	2	3	14	aerial
Rangeland	AJ	1	1	1	NS	aerial
Cucumber	AK(AJ)	1	6	6	7	aerial
Melon	AK(AJ)	1	6	6	7	aerial
Pumpkin	AK(AJ)	1	6	6	7	aerial
Squash	AK(AJ)	1	6	6	7	aerial
Roses[3]	AL[AK](AJ)	1	6	NS	7	aerial
Other herbaceous plants	AL[AK](AJ)	1	6	NS	7	aerial
Woody Plants	AL[AK](AJ)	1	6	NS	7	aerial
CRP acreage, set-aside acreage	AM(AJ)	1	2	3	14	aerial
Rights-of-way	AM(AJ)	1	2	3	14	aerial
Hedgerows	AM(AJ)	1	2	3	14	aerial

Table A-1. Maximum label practices for carbaryl for assessing risks to the California Red Legged Frog.

Crop	Crop Group	Maximum App. Rate (lb a.i./acre)	Maximum Number of Apps.	Max. Seasonal Rate (lb-a.i./acre)	Application Intervals (days)	Application Method
Ditch banks	AM(AJ)	1	2	3	14	aerial
Roadsides	AM(AJ)	1	2	3	14	aerial
Wasteland	AN [AM] (AJ)	1	2	3	14	aerial
Non-urban forests	AO(AJ)	1	2	NS	7	aerial
Tree plantations	AO(AJ)	1	2	NS	7	aerial
Christmas trees	AO(AJ)	1	2	NS	7	aerial
Parks	AO(AJ)	1	2	NS	7	aerial
Rangeland trees	AO(AJ)	1	2	NS	7	aerial
Adult Mosquitoes[7]	AO	1	AN		NA	aerial
Rural shelter belts	AP [AO] (AJ)	1	2	NS	7	aerial
Ticks	AQ	2	AN	NS	NS	ground
Grasshoppers	AQ	1.5	AN	NS	NS	ground
Flax	AR	1.5	2	NS	14	aerial
Home Fruits and Veggies	AR	1.95	6	12.1	NS	ground
Cranberries	AR	2	5	10	7	aerial
Proso millet	AR	1.5	2	NS	14	aerial
Lentils	AR	1.5	4	6	7	aerial
Oysters	AR					
Soybeans	AR	1.5	4	6	7	aerial
Southern peas, dry	AR	1.5	4	6	7	aerial
Sunflower	AR	1.5	2	NS	7	aerial
Tobacco	AR	2	4	NS	7	aerial
Transplants[6]	AR					
Wheat	AR	1.5	2	NS	14	aerial

AN – As needed; NA – not applicable; NS - not specified

1) Treatment is .04 lb per mound. See text for areal application rate estimation. Treatments beyond two applications can be made as additional mounds appear.

2) 4 application allowed per season, but only 3 applications at the maximum rate because of the restriction on the seasonal maximum application rate (6 lb/season)

Table A-1. Maximum label practices for carbaryl for assessing risks to the California Red Legged Frog.						
Crop	**Crop Group**	**Maximum App. Rate (lb a.i./acre)**	**Maximum Number of Apps.**	**Max. Seasonal Rate (lb-a.i./acre)**	**Application Intervals (days)**	**Application Method**
2) uniform 6 ft band around building, water in lightly after application						
3) does not include pre-plant dip of 1.2 lb/acre for sweet potatoes						
4) Labels do not provide information for aerial spray applications but do not restrict the products for aerial application.						
5) Higher rate is for subsurface pests						
6) Application pattern cannot be expressed on an areal ($lb \cdot acre^{-1}$) basis						
7) Application to pastures, rangeland, forests and wastelands; application restrictions (number and frequency) apply;						

Adult mosquitoes. (Group AO) The mosquito adulticide use is intended for pastures, rangeland, forested land and wasteland. For aerial and ground sprays, the recommended spray volume is 1 $quart \cdot acre^{-1}$, which indicates that an aerosol spray is intended. The physical behavior of aerosols is different from coarser sprays, as they do not settle and thus the deposition cannot be described using the current spray drift models are intended to describe the physics of droplets whose movement is dominated by gravity. Consequently, the spray drift assessment used for the other Group AP use sites, does not apply for the use on adult mosquitoes

Alfalfa.(Group AG) Alfalfa is being simulated using the California Alfalfa scenario which was designed for the organophosphate cumulative assessment, and should be protective locations used to grow alfalfa in California and elsewhere on the west coast. Alfalfa is a surrogate for birdsfoot trefoil and clover. For spray drift assessment, the okra use pattern was used as a surrogate for alfalfa as they have the same application rate and methods (aerial application).

Almonds. (Group H) Almonds were simulated using the California almond scenario which was designed to be protective of location used to grown almonds on a national basis. Almonds serve as a surrogate for other nut crops.

Apple. (Group L) Apples were simulated using the California Fruit scenario which was designed for the organophosphate cumulative assessment for assessing exposure for orchard crops in California and is also used as a regional scenario for orchard crops grown in the California Basins. Apples serve as a surrogate for other pome fruits.

Apricots. (Group J) Peaches are being used as a surrogate for apricots as they are both stone fruits and have identical carbaryl use patterns. The CA Fruit scenario is being used to model peaches.

Asparagus.(Group K) The California row crop scenario is being used to model asparagus as this scenario was developed for the California red-legged frog assessments to represent variety of vegetable crops grown in 'rows'.

Beans, dry. (Group AD) 'Beans' is a term that can be used in both general and specific senses, and is thus rather vague. In the most general sense, it can include members of the legume family in the genera *Cicer*, *Glycine*, *Lablab*, *Lupinus*, *Phaseolus*, *Psophocarpus*, *Vicia*, and *Vigna*. In a specific sense, it is often used to refer to the dried fruit of *Phaseolus vulgaris*, the common bean, or 'dry bean.' The crop 'beans' on a pesticide label will have this latter interpretation for the purposes of risk assessment. In part, this is because it is the likely interpretation that will be made by farmers, and also because there is a specific crop listed in the Agricultural Census, 'dry edible beans' that can be associated with it. In a sense, dry beans also serves as a surrogate for a number of other minor legume crops (*e.g.* mung beans, goa beans. Dry beans are usually known by their variety such as black bean, cranberry bean, kidney bean, pea bean, pink bean, great northern bean, pinto bean, navy bean, cannellini, *etc.*

The California Row crop scenario is being used to simulate dry beans as this is scenarios was developed for the California red-legged frog assessments to represent variety of vegetable crops grown in 'rows'. The simulation for dry beans serve as a surrogate for other bean and pea crops to which carbaryl is applied including fresh beans, fresh peas, cow peas, and fresh southern peas. For spray drift assessment, the rice use pattern was used as a surrogate for the legume crops (Group AD) as they have the same single application rate and method (aerial application).

Beans, fresh. (Group AD) As with dry beans, 'fresh beans' has both specific and generic senses, and is thus rather vague. In the specific sense it refers to the immature pods of the common bean, *P. vulgaris,* and is usually referred to as green beans, pole beans, or snap beans. In the general sense, 'fresh beans' can refer to any of the beans or pods from the species listed under dry beans. For the purposes of this assessment, dry beans are being used as a surrogate for fresh beans as they are essentially the same crop with different harvest times and have the same carbaryl use pattern. For spray drift assessment, the rice use pattern was used as a surrogate for the legume crops (Group AD) as they have the same single application rate and method (aerial application).

Beets. (Group Y) This use pattern is for garden beets, which are distinct form sugar beets, although they are forms of the same plant, *Beta vulgaris.* For the purposes of this assessment, celery is being used a surrogate for garden beets, as they have the same carbaryl use pattern, and the California Row Crop scenario is recommended for simulating both crops. For the terrestrial assessments, beets are being modeled with the sorghum use pattern (Group Y) as they have the same carbaryl maximum label use pattern.

Birdsfoot trefoil. (Group AG) Alfalfa serves as a surrogate crop for birdsfoot trefoil, *Lotus corniculatus,* as both are leguminous forage crops and have the same carbaryl use

pattern. . For spray drift assessment, the okra use pattern was used as a surrogate for birdsfoot trefoil as they have the same application rate and methods (aerial application).

Blueberries.(Group O) Grapes are used as a surrogate for blueberries in California as vineyards where wine grapes are grown somewhat resemble blueberry fields, both are grown along the coastal areas of California, and the carbaryl use patterns for grapes and blueberries are the same.

Broccoli. (Group S) Broccoli is a cole crop and is being simulated using the California cole crop scenario which was designed to assess these crops for the California red legged frog assessments. Broccoli serves as a surrogate crop for many of the other cole crops and related mustard crops in this assessment including cabbage, cauliflower, kohlrabi, Chinese cabbage, collards, kale, and mustard greens. For spray drift assessment, the grapes use patterns was used as a surrogate for broccoli as they have the same application rate and methods (aerial application).

Brussels sprouts. (Group Y) Brussels sprouts is a cole crops but was simulated using the California lettuce scenario as it is 'a leafy crop with similar cultural practices' to lettuce, according to current guidance for surrogate scenario assignment for the California red legged frog assessments. Brussels sprouts serves as a surrogate crop for Hanover salad. For the terrestrial assessments, Brussels sprouts are being modeled with the broccoli use pattern (Group T) as they have the same carbaryl maximum label use pattern. For spray drift assessment, the grapes use patterns was used as a surrogate for Brussels sprouts as they have the same application rate and methods (aerial application).

Cabbage. (Group S) Broccoli is used as the surrogate crops for cabbage as it a closely related crop, is grown in the same areas of California and has the same carbaryl label use pattern as cabbage. For spray drift assessment, the grapes use patterns was used as a surrogate for cabbage as they have the same application rate and methods (aerial application).

Cabbage, Chinese. (Group S) Broccoli is used as the surrogate crops for Chinese cabbage as it a closely related crop, is grown in the same areas of California and has the same carbaryl label use pattern as cabbage. For spray drift assessment, the grapes use patterns was used as a surrogate for Chinese cabbage as they have the same application rate and methods (aerial application).

Carrots. (Group Y) Celery is used as a surrogate for carrots as they are both truck crops grown in rows and thus use the California row crop scenario, and they have the same a carbaryl use pattern. For the terrestrial assessments, carrots are being modeled with the sorghum use pattern (Group X) as they have the same carbaryl maximum label use pattern. For spray drift assessment, the grapes use patterns was used as a surrogate for carrots as they have the same application rate and methods (aerial application).

Cauliflower. (Group S) Broccoli is used as the surrogate crops for cauliflower as it a closely related crop, is grown in the same areas of California and has the same carbaryl

label use pattern as cabbage. For spray drift assessment, the grapes use patterns was used as a surrogate for strawberries as they have the same application rate and methods (aerial application). For spray drift assessment, the grapes use patterns was used as a surrogate for cauliflower as they have the same application rate and methods (aerial application).

Caneberries. (Group O) Caneberries are a generally referred to as brambles other than along the Pacific Coast and include raspberries, blackberries, dewberries, and other fruits from the genus *Rubus*. Grapes are used as a surrogate for caneberries in California as vineyards where wine grapes are grown somewhat resemble caneberry fields, both are grown along the coastal areas of California, and the carbaryl use patterns for grapes and caneberries are the same.

Celery. (Group Y) Celery is a vegetable frequently grown in coastal California and is grown in rows, so has been simulated using the California Row Crop scenario. Celery serves as a surrogate crops for prickly pear, beets, and carrots. For the terrestrial assessments, celery is being modeled with the sorghum use pattern (Group X) as they have the same carbaryl maximum label use pattern. For spray drift assessment, the grapes use patterns was used as a surrogate for celery as they have the same application rate and methods (aerial application).

Cherries. (Group J) 'Cherries' refer to two stone fruit crops, sweet cherries (*Prunus avium*) and tart cherries (*P. cerasus*) which are both grown in California. Peaches is being used as a surrogate for cherries and other stone fruits and is being simulated using the California

Chestnuts. (Group H) Chestnuts are grown in California, but information on the volume of production is unavailable. Almonds is being used as the surrogate crop for all nut crops grown in California as they all have the same application pattern and similar growth and production habits.

Christmas trees. (Group AO) The non-urban forests use pattern is being used as a surrogate for Christmas trees as they are both tree crops grown for timber, and the application patterns are similar. For spray drift assessment, the rangeland use pattern was used as a surrogate for Christmas trees as they have the same application rate and methods (aerial application).

Citrus. (Group F) The citrus use patterns include a number of sub-tropical to tropical evergreen tree crops grown for their fruit. These include lemons, limes, oranges, grapefruit, pummelo, tangelo, tangerine, and kumquat. Citrus is being simulated using the California citrus scenario which is used to represent western citrus.

Clover. (Group AG) Clover is a perennial leguminous forage or cover crop. Alfalfa is being used a surrogate crop for clover as it also a leguminous forage crop and the use rates are the same for alfalfa and clover. . For spray drift assessment, the okra use pattern was used as a surrogate for clover as they have the same application rate and methods (aerial application).

Collards. (Group S) Broccoli is used as the surrogate crops for collards, also known as collard greens, as it a closely related crop, is grown in the same areas of California and has the same carbaryl label use pattern as cabbage. For spray drift assessment, the grapes use patterns was used as a surrogate for collards as they have the same application rate and methods (aerial application).

Commercial lawns. (Group B) This use pattern is one of several that consist of maintained turf that is treated with 8 lb/acre/application. These are being simulated separately from residential turf, which can be treated at a higher rate (9.2 $lb \cdot acre^{-1}$) and is expected to be broken into small lots. 'Lawns' is being used as a surrogate for these use patterns.

Corn, field. (Group V) Field corn is grown widely in California and is being simulated using the California corn scenario which designed for estimating exposure from corn in California. Field Corn is being used as a surrogate for popcorn. For the terrestrial assessments, field corn is being modeled with the sweet potato use pattern (Group V) as they have the same carbaryl maximum label use pattern. For spray drift assessment, the grapes use patterns was used as a surrogate for field corn as they have the same application rate and methods (aerial application).

Corn, pop. (Group V) Field corn is being used as a surrogate for pop corn as it is essentially the same crop with similar cultural practices and application rates of carbaryl, but being bred for a different end use of the grain. For the terrestrial assessments, field corn is being modeled with the sweet potato use pattern (Group V) as they have the same carbaryl maximum label use pattern. For spray drift assessment, the grapes use patterns was used as a surrogate for pop corn as they have the same application rate and methods (aerial application).

Corn, sweet. (Group N) Sweet corn is being simulated using the California corn scenario as is field corn, but is being simulated separately as carbaryl can be applied more times per season sweet corn than to field and popcorn.

Cowpeas. (Group AD) Also known as the black-eyed pea, black-eye, Crowder pea, and cream pea or southern pea (*Vigna fasciculata*), this legume is predominantly grown in the Southern United States, but has some limited production in California. Fresh beans are being used as a surrogate for cowpeas as they have the same application practice and bushy or vine legume grown for the bean or pea like dry beans. For spray drift assessment, the rice use pattern was used as a surrogate for the legume crops (Group AE) as they have the same single application rate and method (aerial application).

Crabapple. (Group L) Crapapples are small apples (*Malus* sp.) and are generally used for jams, jellies and other processed uses. The application practice of carbaryl is the same for apples and crabapples. Apples are being used as a surrogate for crabapples and other pome fruits using the California Fruit scenario.

Cranberries. (Group AR) According to the 2002 National Agricultural Census (NASS, 2004), cranberries were not grown in California. Therefore, the risks from cranberries to

the CRLF are considered below the level of concern and exposure from application of carbaryl to cranberries has not been estimated.

CRP & set-aside acreage. (Group AM) The rights-of –way use pattern is being used as a surrogate for CRP and set-aside acreage. CRP acreage is usually along agricultural field borders and thus has the long-narrow aspect of the rights-of –way use pattern and other use patterns in this group. Furthermore, all use patterns in this group have the same maximum carbaryl application practice. For spray drift assessment, the rangeland use pattern was used as a surrogate for CRP land and set-aside acreage as they have the same application rate and methods (aerial application).

Cucumber. (Group AK) Melon is being used as a surrogate for all the registered cucurbits including cucumbers as they all have similar agricultural management practices and the same application practices for carbaryl.

Dandelion. (Group W) Dandelions are grown as a leafy green vegetable in California. Lettuce is being used as a surrogate crop for dandelions for the purposes of this assessment. For spray drift assessment, the grapes use patterns was used as a surrogate for dandelion as they have the same application rate and methods (aerial application).

Ditch banks. (Group AM) The rights-of –way use pattern is being used as a surrogate for ditch banks. Ditch banks are generally long and narrow and thus have the long-narrow aspect of the rights-of –way use pattern and the other use patterns in this group. Furthermore, all use patterns in this group have the same maximum carbaryl application practice. Note that this use pattern implies a close proximity to water, and the possibility of rapid conveyance to water bodies of concern. For spray drift assessment, the rangeland use pattern was used as a surrogate for ditch banks as they have the same application rate and methods (aerial application).

Eggplant. (Group Q) Eggplant is being modeled with the tomatoes use pattern (Group Q) as they are related to tomatoes, have the same bushy growth habit, are both grown in the Central Valley of California, and they have the same carbaryl maximum label use pattern. For spray drift assessment, the grapes use patterns was used as a surrogate for eggplant as they have the same application rate and methods (aerial application).

Endive. (Group W) Endive is a crop grown for the immature leaves which still tightly packed in a head, similar to head lettuce. Lettuce is being used as a surrogate crop for dandelions for the purposes of this assessment as endive has the same carbaryl maximum application as lettuce. For spray drift assessment, the grapes use patterns was used as a surrogate for endive as they have the same application rate and methods (aerial application).

Filberts. (Group H) Almonds is being used as the surrogate crop for all nut crops grown in California as they all have the same application pattern and similar growth and production practices.

Flowerbeds around buildings. (Group B) This use pattern is distinct from the ornamentals use ('flowers' – see below) in that it is restricted to a 6 foot width around the foundation of buildings. It was simulated using the residential scenario.

Flowers. (Group I) This use pattern is separate from the 'flower beds around buildings use patterns' above as it is more generic, but has a lower use rate. Flowers is being used a surrogate for shrubs, as they the use pattern for all three is for the plants used as ornamentals and they have the same maximum carbaryl application pattern. The California ornamentals scenario is being used to simulate flowers for the aquatic exposure assessment.

Flax. (Group AR) While there is a carbaryl use pattern for flax, carbaryl cannot be used on flax in California.

Golf courses. (Group B) This use pattern is one of several that consist of maintained turf that is treated with 8 lb/acre/application. These are being simulated separately from residential turf, which can be treated at a higher rate (9.2 $lb \cdot acre^{-1}$) and is expected to be broken into small lots. 'Lawns' is being used as a surrogate for these use patterns.

Grapes. (Group O) The grapes scenario is being used as a surrogate for other small berry crops grown on bushes or canes, including the caneberries (*e.g.* blackberries and raspberries) and blueberries. These crops have somewhat similar growth habits and agricultural practices and the same carbaryl maximum label application rate. The California wine grape scenario is being used to simulate grapes.

Grasshoppers. (Group AQ) The grasshoppers use pattern is for all use sites on the Sevin 4F label (Reg. No. 264-349). The tick use pattern is being used as a surrogate for the grasshoppers, and both use patterns are for a pest across a wide range of sites, and the ticks use pattern has a higher application rate.

Grass for seed. (Group AI) Grass for seed is being simulated using the California turf scenario. For the terrestrial assessments, grass for seed is being modeled with the pasture use pattern (Group AI) as they have the same carbaryl maximum label use pattern. . For spray drift assessment, the okra use pattern was used as a surrogate for grass for seed as they have the same application rate and methods (aerial application).

Hanover salad. (Group T) This crop is the same species as canola and rape, but it has been bred to emphasize the leaves which are used in salads. Specific information on where Hanover salad is grown commercially could not be located. But guides for it culture on the internet are dominated by those from southeastern states. Given their propensity for vegetable culture in California, it production in California cannot be ruled out. (http://edis.ifas.ufl.edu/MV076 http://www.floridata.com/ref/b/bras_ole_kale.cfm). For the purposes of this assessment, Brussels sprouts are being used as a surrogate crop. . Brussels sprouts serves as a surrogate crop for Hanover salad. For the terrestrial assessments, Brussels sprouts are being modeled with the broccoli use pattern (Group T) as they have the same carbaryl maximum label use pattern. For spray drift assessment,

the grapes use patterns was used as a surrogate for Hanover salad as they have the same application rate and methods (aerial application).

Hedgerows. (Group AM) The rights-of –way use pattern is being used as a surrogate for hedgerows. Hedgerows are generally long and narrow and thus have the long-narrow aspect of the rights-of –way use pattern and the other use patterns in this group. Furthermore, all use patterns in this group have the same maximum carbaryl application practice. For spray drift assessment, the rangeland use pattern was used as a surrogate for hedgerows as they have the same application rate and methods (aerial application).

Herbaceous plants. (Group AL) Carbaryl lists 'other herbaceous plants' and a use site, apparently referring to herbaceous plant grown as ornamentals. Roses is being used a surrogate for herbaceous and woody ornamental plants as they the use pattern for all three is for the plants used as ornamentals and they have the same maximum carbaryl application pattern. For the terrestrial assessments, herbaceous plants is being modeled with the melon use pattern (Group AK) as they have the same carbaryl maximum label use pattern. For spray drift assessment, the rangeland use pattern was used as a surrogate for herbaceous plants as they have the same application rate and methods (aerial application).

Home Fruits and Vegetables. (Group AR) This use pattern is for all crops grown in home gardens. This use pattern is restricted from California and therefore has not been otherwise considered in this assessment.

Horseradish. (Group Z) Horseradish was simulated using the cole crop scenario. For the terrestrial assessments, horseradish is being modeled with the sorghum use pattern (Group Y) as they have the same carbaryl maximum label use pattern. For spray drift assessment, the grapes use patterns was used as a surrogate for horseradish as they have the same application rate and methods (aerial application).

Home lawns. (Group A) For aquatic exposure assessments, the California residential and California impervious scenario is being used to simulate the home lawn use pattern. Home lawns is being used as a surrogate for fire ants as this is expected to be a common use site for control of fire ants and the application rate to home lawns is greater than for the control of fire ants.

Imported fire ants. (Group A) Fire ants have found in southern California and carbaryl has a use pattern on fire ants of 1½ of a fluid oz of Sevin SL (Reg. No. 432-1227) per mound which corresponds to 0.0469 lb per mound. A high end measurement of fire ant mound density is 393 mounds per hectare (Hood *et al.,* 2003) which corresponds to 158 mounds per acre. This means that a high end estimate for the per acre application rate of carbaryl to fire ants is 7.4 $lb \cdot acre^{-1}$. Since this is less than the application for home lawns, the home lawn rate application pattern is being used as a surrogate for treatments for fire ants.

Kale. (Group S) Broccoli is used as the surrogate crops for kale as it a closely related crop, is grown in the same areas of California and has the same carbaryl label use pattern as cabbage. For spray drift assessment, the grapes use patterns was used as a surrogate for kale as they have the same application rate and methods (aerial application).

Kohlrabi. (Group S) Broccoli is used as the surrogate crops for kohlrabi as it a closely related crop, is grown in the same areas of California, and has the same carbaryl label use pattern as cabbage. For spray drift assessment, the grapes use patterns was used as a surrogate for kohlrabi as they have the same application rate and methods (aerial application).

Lawns. (Groups C) This use pattern includes ornamental and recreational turf and is being modeled separately from the residential use patterns because the use rate is somewhat lower and description of the use pattern could allow for application to areas much larger than the typical residential lawn considered for the residential lawn use pattern. Two use patterns were simulated as it could not be determined prior to simulation which use patterns would produce higher EECs. For the terrestrial assessments, lawns are being modeled with the commercial lawns use pattern (Group B) as they have nearly the same carbaryl maximum label use pattern. For spray drift assessment, the flower beds around buildings use patterns was used as a surrogate for lawns as they have the similar application rate and methods (ground application).

Lentils. (Group AR) According to the 2002 National Agricultural Census (NASS, 2004), lentils were not grown in California. Therefore, the risks from lentils to the CRLF are considered below the level of concern and exposure from application of carbaryl to lentils has not been estimated.

Lettuce, head. (Group W) Dandelions are grown as a leafy green vegetable in California. Lettuce is being used as a surrogate crop for dandelions for the purposes of this assessment as endive has the same carbaryl maximum application as lettuce. For spray drift assessment, the grapes use patterns was used as a surrogate for head lettuce as they have the same application rate and methods (aerial application).

Lettuce, leaf. (Group W) Dandelions are grown as a leafy green vegetable in California. Head lettuce is being used as a surrogate crop for dandelions for the purposes of this assessment as endive has the same carbaryl maximum application as head lettuce. For spray drift assessment, the grapes use patterns was used as a surrogate for leaf lettuce as they have the same application rate and methods (aerial application).

Loquat. (Group M) Loquats are the fruit of a small evergreen tree. Loquat trees may grow the 5 to 10 meters tall but are usually less the 6 meters. While the application pattern for loquats is similar to the pome fruits, as an evergreen fruit tree, the citrus scenario was used a more appropriate surrogate scenario. For the terrestrial and spray drift assessments, loquats are being modeled with the apples use pattern (Group L) as they have the same carbaryl maximum label use pattern.

Melon. (Group AK) Melons are cucurbits with sweet soft flesh and include cantaloupes, honeydews, and muskmelons and several other minor species and cultivars. Melon is being used as a surrogate for all the registered cucurbits including cucumbers as they all have similar agricultural management practices and the same application practices for carbaryl. Melons are being simulated using the California melon scenario.

Mustard greens. (Group S) Broccoli is used as the surrogate crops for cauliflower as it a closely related crop, is grown in the same areas of California, and has the same carbaryl label use pattern as cabbage. For spray drift assessment, the grapes use patterns was used as a surrogate for mustard greens as they have the same application rate and methods (aerial application).

Nectarines. (Group J) Peaches are being used as a surrogate for nectarines as they are both stone fruits and have identical carbaryl use patterns. The CA Fruit scenario is being used to model peaches

Non-urban forest. (Group AO) The non-urban forests use pattern is being used as a surrogate for forested or partly forested scenarios where the application is to the trees and 1 $lb \cdot acre^{-1}$ or less. These use patterns are tree plantations, Christmas trees, parks, and rangeland trees. Note that the application pattern for parks in this group is to the trees whereas the application pattern for parks in Group E is apparently to turf. For spray drift assessment, the rangeland use pattern was used as a surrogate for non-urban forests as they have the same application rate and methods (aerial application).

Okra. (Group AE) Okra is being simulated using the California tomato scenario as they are both bushy annual vegetable crops grown for their fruit.

Olives. (Group G) Olives are being simulated using the California olives scenario which was designed for the red legged frog assessments for estimating exposure from applications to olives.

Oriental pears. (Group L) Apples is being as a surrogate for oriental pears and the other pome fruits as the application practice of carbaryl is the same for apples and all the pome fruits.

Oysters. (Group AR) The use of carbaryl on oyster beds is restricted from use in California so the exposure from this use has not been estimated.

Parks. (Group E) This use pattern is distinct from the use pattern in Group AP in that this use pattern is application to the turf whereas that in Group AP is apparently to trees. Lawns is being used a surrogate for the purposes of the terrestrial exposure assessment as the single application rate is similar, but the number of applications is one rather than four. For spray drift assessment, the flower beds around buildings use patterns was used as a surrogate for lawns as they have the similar application rate and methods (ground application).

Parks. (Group AO) This use pattern is distinct from the use pattern in Group E in that this use pattern is application to trees whereas that in Group E is apparently to turf. The non-urban forests use pattern is being used as a surrogate for parks, or conceptually 'urban forests'). For spray drift assessment, the rangeland use pattern was used as a surrogate for trees in parks as they have the same application rate and methods (aerial application).

Parsley. (Group W) Head lettuce is being used as a surrogate crop for parsley for the purposes of this assessment as parsley has the same carbaryl maximum application as lettuce and both are grown in coastal California for the foliage. For spray drift assessment, the grapes use patterns was used as a surrogate for parsley as they have the same application rate and methods (aerial application).

Parsnip. (Group AA) Parsnip is a root crop (*Pastinaca sativa)* related to the carrot and parsley. As a root crop, potatoes are being used as a surrogate as they both have the same maximum carbaryl application pattern. For the terrestrial assessments, Parsnip is being modeled with the sorghum use pattern (Group Y) as they have the same carbaryl maximum label use pattern. For spray drift assessment, the grapes use patterns was used as a surrogate for parsnip as they have the same application rate and methods (aerial application).

Pasture. (Group AH) Pasture is being simulated using the California rangeland scenario. The rangeland scenario was intended for use for grazed grassland such as pasture and was designed specifically for assessing exposure for the California Red Legged Frog assessments. For spray drift assessment, the okra use pattern was used as a surrogate for pasture as they have the same application rate and methods (aerial application).

Peaches. (Group J) Peaches are being used as a surrogate for the stone fruits (peaches, plums, prunes, nectarines, cherries and apricots) as all stone fruits have identical carbaryl use patterns. The CA Fruit scenario is being used to model peaches, which is designed for deciduous fruit trees grown in orchards in California's Central Valley.

Pears. (Group L) Apples is being as a surrogate for pears and the other pome fruits as the application practice of carbaryl is the same for apples and all the pome fruits.

Peanuts. (Group S) Peanuts are being simulated using the California row crop scenario as they are a legume like peas and beans which are the crops for which the row crop scenario was designed. For the terrestrial assessments, peanuts are being modeled with the tomatoes use pattern (Group Q) as they have the same carbaryl maximum label use pattern. For spray drift assessment, the grapes use patterns was used as a surrogate for peanuts as they have the same application rate and methods (aerial application). For spray drift assessment, the grapes use patterns was used as a surrogate for peanuts as they have the same application rate and methods (aerial application).

Peas, dry. (Group AD) 'Dry beans' are being used as a surrogate for dry peas as they have the same application practice and bushy or vine legume grown for the bean or pea like dry beans. For

spray drift assessment, the rice use pattern was used as a surrogate for the legume crops (Group AE) as they have the same single application rate and method (aerial application).

Peas, fresh. (Group AD) . 'Dry beans' are being used as a surrogate for fresh peas, also known as green peas, or English peas, as they have the same application practice and bushy or vine legume grown for the bean or pea like dry beans. For spray drift assessment, the rice use pattern was used as a surrogate for the legume crops (Group AD) as they have the same single application rate and method (aerial application).

Peas, southern, fresh. (Group AD) Also known as the black-eyed pea, black-eye, Crowder pea, and cream pea, or cowpea (*Vigna fasciculata*), this legume is predominantly grown in the Southern United States, but has some limited production in California. 'Dry beans' are being used as a surrogate for cowpeas as they have the same application practice and bushy or vine legume grown for the bean or pea like dry beans For spray drift assessment, the rice use pattern was used as a surrogate for the legume crops (Group AE) as they have the same single application rate and method (aerial application).

Pecans. (Group H) Almonds is being used as the surrogate crop for all nut crops grown in California as they all have the same application pattern and similar growth and production practices.

Peppers. (Group Q) Tomatoes are being used as a surrogate crop for peppers as they are both bushy annual vegetable crops grown for their fruit and they have the same carbaryl maximum use pattern. For spray drift assessment, the grapes use patterns was used as a surrogate for peppers as they have the same application rate and methods (aerial application).

Pistachio. (Group H) Almonds is being used as the surrogate crop for all nut crops grown in California as they all have the same application pattern and similar growth and production practices.

Plums. (Group J) Peaches are being used as a surrogate for plums as they are both stone fruits and have identical carbaryl use patterns. The CA Fruit scenario is being used to model peaches.

Potato. (Group AA) The potato use pattern is being used as a surrogate for several root crops including parsnip, rutabaga, and turnip. Potatoes are being simulated on a California potato scenario. . For the terrestrial assessments, potatoes are being modeled with the sorghum use pattern (Group X) as they have the same carbaryl maximum label use pattern. For spray drift assessment, the grapes use patterns was used as a surrogate for potato as they have the same application rate and methods (aerial application).

Prickly pear. (Group Y) Prickly pear is the fruit of a cactus of the same name. Celery is being used as a surrogate for prickly pear in this assessment as they have the carbaryl maximum label application practice. For the terrestrial assessments, prickly pear is being modeled with the sorghum use pattern (Group X) as they have the same carbaryl maximum label use pattern. For spray drift assessment, the grapes use patterns was used

as a surrogate for prickly pear as they have the same application rate and methods (aerial application).

Prunes. (Group J) Peaches are being used as a surrogate for prunes, which are dried black plums, as they are both stone fruits and have identical carbaryl use patterns. The CA Fruit scenario is being used to model peaches.

Proso millet. Carbaryl is restricted from use on proso millet in California, therefore no exposure to wildlife is anticipated from this use and no estimates of exposure were made.

Pumpkin. (Group AK) Melon is being used as a surrogate for all the registered cucurbits including pumpkin as they all have similar agricultural management practices and the same application practices for carbaryl.

Rangeland. (Group AJ) Rangeland is being simulated using the California rangeland scenario which was developed for assessing exposure to the California red legged frog from the use of pesticides on this site

Rangeland trees. (Group AO) This use pattern is distinct from the rangeland use pattern in Group AK in that it is application to the trees. The non-urban forests use pattern is being used as a surrogate for rangeland trees as they are both tree crops and the application patterns are similar. For spray drift assessment, the rangeland use pattern was used as a surrogate for rangeland trees as they have the same application rate and methods (aerial application).

Radish. (Group AB) Radishes are being simulated using the onion scenario which is also a crop where the edible part of the plant grows underground. For the terrestrial assessments, radishes are being modeled with the sorghum use pattern (Group X) as they have the same carbaryl maximum label use pattern. For spray drift assessment, the grapes use patterns was used as a surrogate for radish as they have the same application rate and methods (aerial application).

Recreation Areas. (Group B) This use pattern is one of several that consist of maintained turf that is treated with 8 lb/acre/application. These are being simulated separately from residential turf, which can be treated at a higher rate (9.2 $lb \cdot acre^{-1}$) and is expected to be broken into small lots. ‘Lawns’ is being used as a surrogate for these use patterns.

Rice. (Group AC) Rice was assessed using the rice exposure calculation (Orrick and Young 2007).

Rights-of-way. (Group AM) The rights-of –way use pattern is being used as a surrogate for hedgerows, CRP and set-aside acreage, ditch banks and roadsides. These use patterns generally long and narrow and thus have the long-narrow aspect of the rights-of –way use pattern. Furthermore, all use patterns in this group have the same maximum carbaryl application practice. The California rights-of-way and impervious scenarios are being used to assess aquatic exposure for this assessment. For spray drift assessment, the

rangeland use pattern was used as a surrogate for rights-of-way as they have the same application rate and methods (aerial application).

Roadsides. (Group AM) The rights-of –way use pattern is being used as a surrogate for roadsides. Roadsides are generally long and narrow and thus have the long-narrow aspect of the rights-of –way use pattern and to some extent, the roadsides, and rights-of-way use pattern can be considered synonymous. Furthermore, all use patterns in this group have the same maximum carbaryl application practice. For spray drift assessment, the rangeland use pattern was used as a surrogate for roadsides as they have the same application rate and methods (aerial application).

Roses. (Group AL) Roses is being used as a surrogate for the 'other herbaceous plants' and woody plants use patterns as all three are for plants grown as ornamentals and the carbaryl use pattern is the same. The roses use pattern was simulated using the California ornamentals scenario. For the terrestrial assessments, roses are being modeled with the melon use pattern (Group AK) as they have the same carbaryl maximum label use pattern. For spray drift assessment, the roses use pattern was used as a surrogate for Christmas trees as they have the same application rate and methods (aerial application).

Rural shelter-belts. (Group AP) This use patterns was assessed using the rights-off-way scenario as it is a long, narrow use site like rights-of-ways. For the terrestrial assessments, rural shelter belts are being modeled with the melon use pattern (Group AO) as they have the same carbaryl maximum label use pattern. For spray drift assessment, the rangeland use pattern was used as a surrogate for rural shelter belts as they have the same application rate and methods (aerial application).

Rutabaga. (Group AA) Rutabaga is a root crop (*Brassica napobrassica)* in the mustard family related to cole crops and turnips. As a root crop, potatoes are being used as a surrogate as they both have the same maximum carbaryl application pattern. For the terrestrial assessments, rutabaga is being modeled with the sorghum use pattern (Group X) as they have the same carbaryl maximum label use pattern. For spray drift assessment, the grapes use patterns was used as a surrogate for rutabaga as they have the same application rate and methods (aerial application).

Salsify. (Group AA) Salsify, (*Tragopogon porrifolius*) also known as purple salsify and oyster plant is grown for the root and sometimes the young shoots. The potato use pattern has been used as a surrogate for salsify as it has the carbaryl maximum label use rate as salsify and both are root crops. For the terrestrial assessments, salsify is being modeled with the sorghum use pattern (Group X) as they have the same carbaryl maximum label use pattern. For spray drift assessment, the grapes use patterns was used as a surrogate for salsify as they have the same application rate and methods (aerial application).

Shrubs. (Group I) The flowers use pattern is being used as a surrogate for shrubs as they are both primarily used as ornamentals and the carbaryl maximum label use pattern is the same for both.

Sod farms. (Group B) This use pattern is one of several that consist of maintained turf that is treated with 8 lb/acre/application. These are being simulated separately from residential turf, which can be treated at a higher rate (9.2 $lb \cdot acre^{-1}$) and is expected to be broken into small lots. 'Lawns' is being used as a surrogate for these use patterns.

Sorghum. (Group X) Sorghum is being simulated using California corn scenario as they are both row-planted grasses. For spray drift assessment, the grapes use patterns was used as a surrogate for sorghum as they have the same application rate and methods (aerial application).

Southern peas, dry. (Group AR) According to the 2002 National Agricultural Census (NASS, 2004), dry southern peas were not grown in California. Therefore, the risks from dry southern peas to the CRLF are considered below the level of concern and exposure from application of carbaryl to dry southern peas has not been estimated.

Soybeans. (Group AR) According to the 2002 National Agricultural Census (NASS, 2004), soybeans were not grown in California. Therefore, the risks from soybeans to the CRLF are considered below the level of concern and exposure from application of carbaryl to soybeans has not been estimated.

Spinach. (Group W). Head lettuce is being used as a surrogate crop for spinach for the purposes of this assessment as spinach has the same carbaryl maximum application as head lettuce and both are grown in coastal California for the foliage. For spray drift assessment, the grapes use patterns was used as a surrogate for spinach as they have the same application rate and methods (aerial application).

Squash. (Group AK) Melon is being used as a surrogate for all the registered cucurbits including squash as they all have similar agricultural management practices and the same application practices for carbaryl.

Strawberries. (Group P) Strawberries are being simulated using the California strawberry scenario. For the terrestrial assessments, strawberries are being modeled with the grapes use pattern (Group O) as they have the same carbaryl maximum label use pattern. For spray drift assessment, the grapes use patterns was used as a surrogate for strawberries as they have the same application rate and methods (aerial application).

Sugar beets. (Group AF). Sugar beets are being simulated on the California sugar beet scenario that was designed for use in the California red legged frog assessments for this crop. For spray drift assessment, the okra use pattern was used as a surrogate for sugar beets as they have the same application rate and methods (aerial application).

Sunflower. (Group AR) Carbaryl cannot be applied on sunflowers in California.

Sweet potato. (Group U) Sweet potatoes are being simulated using the California potato scenario.

Swiss chard. (Group W) Swiss chard is botanically the same plant as beets, but has been bred for it leaves rather than for the root. Head lettuce is being used as a surrogate crop for Swiss chard for the purposes of this assessment as Swiss chard has the same carbaryl maximum application as head lettuce and both are grown in coastal California for the foliage. For spray drift assessment, the grapes use patterns was used as a surrogate for Swiss chard as they have the same application rate and methods (aerial application).

Ticks. (Group AQ) The ticks use pattern is for all use sites on the Sevin 4F label (Reg. No. 264-349) and is for control of ticks which serve as vectors of Lyme disease (*Ixodes* and *Ablyomma* species). The application rate is 1 to 2 lb·acre^{-1},"as needed". It is assumed that since there are no restrictions on the number of applications, 25 applications were assumed. As no minimum re-application interval was indicated, 3 d was assumed. The turf use patterns was assumed for scenario, as it is expected that turf and turf-like scenarios would serve as the most common type of land cover to which this application is applied. This use pattern serves as surrogate for grasshoppers use pattern.

Tomatoes. (Group Q) Tomatoes are being simulated using the California tomato scenario. The tomatoes use pattern is being used as a surrogate for peppers. For spray drift assessment, the grapes use patterns was used as a surrogate for tomatoes as they have the same application rate and methods (aerial application). For spray drift assessment, the grapes use patterns was used as a surrogate for tomatoes as they have the same application rate and methods (aerial application).

Tobacco. (Group AR) According to the 2002 National Agricultural Census (NASS, 2004), tobacco was not grown in California. Therefore, the risks from tobacco to the CRLF are considered below the level of concern and exposure from application of carbaryl to tobacco has not been estimated.

Transplants. (Group AR) The application pattern for transplants cannot be resolved to a lb per acre application rate. A application rate of this type is necessary in order to estimate the risk using EFED's current assessment methods.

Tree plantations. (Group AO) The non-urban forests use pattern is being used as a surrogate for tree plantations as they are both forests and can be used for timber, and the carbaryl maximum label use pattern is the same for both. For spray drift assessment, the rangeland use pattern was used as a surrogate for tree plantations as they have the same application rate and methods (aerial application).

Turnip. (Group AA) Turnips are a root crop (*Brassica rapa*) in the mustard family related to bok choy, Chinese cabbage and rapini. As a root crop, potatoes are being used as a surrogate as they both have the same maximum carbaryl application pattern. For the terrestrial assessments, turnip is being modeled with the sorghum use pattern (Group X) as they have the same carbaryl maximum label use pattern. For spray drift assessment,

the grapes use patterns was used as a surrogate for turnips as they have the same application rate and methods (aerial application).

Walnuts. (Group H) Almonds is being used as the surrogate crop for all nut crops grown in California as they all have the same application pattern and similar growth and production practices.

Wasteland. (Group AN) This is a poorly defined use pattern which an implication that the land is damaged or underutilized. Since this might include abandoned parking lots, the California impervious scenario was used estimate exposure for this use pattern. For the terrestrial assessments, wasteland is being modeled with the rights-of-way use pattern (Group AM) as they have the same carbaryl maximum label use pattern. For spray drift assessment, the rangeland use pattern was used as a surrogate for wasteland as they have the same application rate and methods (aerial application).

Wheat. (Group AR) Carbaryl is restricted from use on wheat in California, therefore no exposure to wildlife is anticipated from this use and no estimates of exposure were made.

Woody plants. (Group AL) Carbaryl lists 'woody plants' as a use site, referring to woody plant grown as ornamentals. Roses is being used a surrogate for herbaceous and woody ornamental plants as they the use pattern for all three is for the plants used as ornamentals and they have the same maximum carbaryl application pattern. For the terrestrial assessments, woody plants are being modeled with the melon use pattern (Group AK) as they have the same carbaryl maximum label use pattern. For spray drift assessment, the rangeland use pattern was used as a surrogate for woody plants as they have the same application rate and methods (aerial application).

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