BRITISH COLUMBIA

Environmental Appeal Board

Fourth Floor 747 Fort Street
Victoria British Columbia
Telephone: (250) 387-3464
Facsimile: (250) 356-9923

Mailing Address:
PO Box 9425 Stn Prov Govt
Victoria BC V8W 9V1

APPEAL NO. 2003-PES-003(a)

In the matter of an appeal under section 15 of the *Pesticide Control Act*, R.S.B.C. 1996, c. 360.

BETWEEN:	Nadine Dechiron on behalf of the Granby Wilderness Society and the Boundary Naturalists	**APPELLANT**
AND:	Deputy Administrator, Pesticide Control Act	**RESPONDENT**
AND:	Ministry of Forests	**THIRD PARTY**
BEFORE:	A Panel of the Environmental Appeal Board Alan Andison, Chair	
DATE:	Conducted by way of written submissions concluding on April 5, 2004	
APPEARING:	For the Appellant:	Thomas Buri, QC, Counsel, Richard Overstall, Counsel
	For the Respondent and the Third Party:	Karen Tannas, Counsel Dawn House, Counsel

APPEAL

This appeal was filed against Pest Management Plan Approval No. 664-003-2003/2008 (the "Approval"), issued on May 1, 2003, by Stuart Craig, Deputy Administrator, Pesticide Control Act, Ministry of Water, Land and Air Protection ("WLAP"). The Approval was issued to the Minister of Forests, BC Timber Sales, Kootenay Business Area. It approves the Pest Management Plan (the "Plan") submitted by the Ministry of Forests ("MOF"), Boundary Forest District. The Approval authorizes the use of the pesticides *Vision* (active ingredient glyphosate) and *Release* (active ingredient triclopyr) to control vegetation in cutblocks on Crown land within the Boundary Timber Supply Area ("TSA"), during the period from May 1, 2003 to April 30, 2008.

The Environmental Appeal Board has the authority to hear these appeals under section 11 of the *Environment Management Act* and section 15 of the *Pesticide Control Act* (the "*Act*"). The Board's authority under section 15(7) of the *Act* is as follows:

On an appeal, the appeal board may:

(a) send the matter back to the person who made the decision being appealed, with directions,

(b) confirm, reverse or vary the decision being appealed, or

(c) make any decision that the person whose decision is appealed could have made, and that the board considers appropriate in the circumstances.

The Appellant requests that the Board reverse the Deputy Administrator's Approval of the Plan. Alternatively, the Appellant requests an order attaching certain conditions to the Plan.

BACKGROUND

The Approval states that it applies to Crown forest lands within the Boundary TSA. The exact area to which the Plan applies and the identity of the Plan Holder are issues to be decided in this appeal.

The main commercial use of the forest lands that are covered by the Plan is the growth of trees for timber production. When crop tree seedlings are planted after timber harvesting, competing vegetation may hinder the crop trees' growth, sometimes to the point of mortality. The MOF uses various methods to control competing vegetation, including pesticides. Vegetation control techniques may be used during site preparation (before seedlings are planted or natural regeneration begins), and during brushing (after seedlings have been planted or natural regeneration has begun).

Under section 6 of the *Act*, a person must not apply a pesticide to an area of land unless the person holds a pesticide use permit or an approved pest management plan. A pest management plan describes a program for controlling pests or reducing pest damage using integrated pest management, and sets out a decision-making process relating to anticipated pesticide use within an operating area. Pest management plans may be approved for a maximum of 60 months. Annual pesticide treatments, within the area covered by the plan, may take place in accordance with the terms and conditions of the approved plan, the restrictions on the pesticide's registered label, and the requirements of the *Act* and the *Pesticide Control Regulation*, B.C. Reg. 319/81 (the "*Regulation*").

The area covered by a pest management plan is divided into operating zones based on the kind of treatments permitted or the pre-treatment notification required. Section 4.3 of the Plan describes four possible types of operating zones (referred to in the Plan as "OZs"):

> **OZ 1** – areas with minimal specific concerns, which MOF may treat with herbicides without providing additional prior notification to individuals or organizations. (With the exception of prior notification to the Ministry of Water, Land & Air Protection).

> **OZ 2** – areas for which specific concerns have been identified and for which additional notification may be required before treatment.
>
> **OZ 3** – areas which will require a thorough site-specific review and a specific authorization by the Deputy Administrator during the term of the PMP [the Plan].
>
> **OZ 4** - areas where no vegetation management will be conducted or where only non-chemical methods will be used. Italy Sutherland Watershed has had exhaustive public input and has received written agreement that herbicides would not be used. All other Designated Community Watersheds (Overton, Moody Creek, Bridesville and Baldy) have also been included in this operating zone.

In this case, most of the Plan area is designated as operating zone 1, while certain watersheds are designated as operating zone 4. No areas have been designated as operating zones 2 or 3.

The Plan outlines the process by which the Plan Holder will decide if brushing and site preparation treatments are required, which vegetation control methods should be used, and the conditions under which pesticide use may occur. For example, section 4.0 of the Plan states that a Registered Professional Forester, Forestry Technician, or a consultant assigned by the MOF, is responsible for planning and coordinating integrated vegetation management. Section 4.1 states that a detailed site assessment ("DSA") will be completed for every site where pesticide treatments are anticipated during the term of the Plan. Section 4.9 requires the MOF to forward to WLAP an annual written Notification of Intention to Treat ("NIT") for each year that the Plan is in effect, by December 31 of the year prior to the proposed treatments. Section 5.6 states that the pesticide application methods to be used under the Plan include cut stump application, hack and squirt application, basal bark application, backpack sprayers, and wick applicators. The potential target species listed in section 3.2 of the Plan are aspen, cottonwood, birch, willow, birch spirea, Douglas maple, mountain alder, ribes, rubus, elderberry, thimbleberry, pinegrass, fireweed, rhododendron and bracken ferns.

Section 6 of the Plan sets out numerous conditions for pesticide use, including requirements for pesticide-free zones along streams, lakes, water intakes or domestic wells, and wetlands within the area covered by the Plan. It also states as follows with regard to grizzly bear habitat:

> No aerial treatments should take place in areas designated as moderate, or high value grizzly bear habitat as noted in a Land Resource Management Plan (LRMP) such as *Kootenay-Boundary Higher Level Plan Order*. Similar mapping may be available for guidance in other Timber Supply Areas (TSA's). When not in competition with conifers, direct treatment of Vaccinium, Devils Club, bearberry, currants and other berry producing shrub species and mountain ash shall be avoided.

> Moist areas such as areas containing skunk cabbage, horsetail. Carex, lily, cow parsnip, sedges, clover should be avoided or manually treated, as these are preferred forage areas.

The Plan also includes conditions regarding: public notice; weather conditions during which pesticide use may occur; transportation, mixing and loading of pesticides; site monitoring; and reporting.

On May 1, 2003, the Deputy Administrator issued the Approval. The terms and conditions in the Approval form part of the approved Plan, and include additional requirements for public notification prior to treatment and standards for pesticide use. Relevant terms and conditions of the Approval are as follows:

1.1 The plan holder shall, within 7 days of the plan approval date:

(1) The plan holder shall make available within 7 days of receipt of the approval, for the term of the approval, a copy of the approval and the PMP with relevant maps at the local office of the plan holder to allow inspection by the public.

...

1.4 Signs shall be posted at visible access points to the treatment areas where pedestrian traffic is likely to occur advising of treatments, and such signs shall be maintained for a minimum of 2 weeks following treatment. The signs shall include the following information:

a) Name of plan holder;

b) Plan number;

c) Purpose of pesticide use;

d) Trade and common name of herbicide(s) used;

e) Dates(s) of herbicide application; and

f) Telephone number of plan holders office.

...

2.1 If herbicide applications are undertaken by the plan holder's staff, the plan holder shall possess a current BC Pest Control Service Licence.

2.2 Each contracting firm conducting herbicide applications under this plan shall possess a current BC Pest Control Service Licence.

2.3 All herbicide use shall be carried out by or under the direct supervision of an individual with a valid BC pesticide applicator certificate in the Forest General or Forestry Non-Broadcast categories, as appropriate.

2.4 All use of herbicides shall be carried out using ground operated low nozzle pressure (less than 300 kPa) application equipment.

2.5 If an area proposed for herbicide treatment is to be grazed by domestic livestock, the plan holder shall inform the graziers and the Ministry of Forests District range staff of the treatment as well as potential impact on the forage resource. Grazing animals shall not be permitted to enter treated areas prior to the re-entry time specified in the herbicide label.

2.6 The plan holder shall conduct post-treatment inspections of all treated sites. The treatments shall be evaluated for compliance with the terms and conditions of the plan and the standards contained in this Approval. Efficacy information shall also be collected.

On June 2, 2003, Nadine Dechiron filed an appeal of the Approval on behalf of the Granby Wilderness Society and the Boundary Naturalists. Her grounds for appeal included the following:

- The Plan fails to ensure adequate pesticide-free zones around key environmental features, including habitat of key species, aquatic habitat and other environmentally sensitive areas. The Plan is vague as to the methods and level of inventory of those features.

- The Granby grizzly is the second most endangered grizzly bear population in B.C. The Plan fails to acknowledge the Kettle-Granby grizzly recovery strategy being prepared by WLAP, and the tenuous state of the Granby grizzly population. There should be no eradication of grizzly food plants in the entire Kettle-Granby grizzly recovery area. Failing that, the Plan will undermine the recovery strategy and could hasten the extirpation of that population.

- There is insufficient information in the Plan about how pesticides will be applied to provide a basis by which the Deputy Administrator could be satisfied that the pesticide use will not cause an unreasonable adverse effect to the environment, pursuant to section 6(3) of the *Act*.

When arguing the merits of the appeal, the Appellant raised additional issues concerning whether the Deputy Administrator improperly delegated his discretion to approve the Plan, and what legal test should be applied by the Board when determining whether the use of pesticides, under an approved pest management plan, will cause an unreasonable adverse effect.

The Appellant requests that the Board reverse the Approval of the Plan. In the alternative, the Appellant requests that the Board add the following condition to the Plan:

- Prohibiting the eradication of, and use of pesticides on, grizzly forage foods.

The Deputy Administrator and the MOF made a joint submission regarding this appeal. They oppose the appeal and request that the Board confirm the Approval.

ISSUES

The issues to be decided in this case are as follows:

1. What is the appropriate test to be applied when determining whether the use of pesticides under a pest management plan will cause an unreasonable adverse effect?

2. Whether the Deputy Administrator improperly delegated his discretion in approving the Plan.

3. Whether the Plan meets the statutory content requirements for pest management plans under the *Act*.

4. Whether the use of pesticides in accordance with the approved Plan will have an adverse effect?

5. If so, whether the adverse effect is unreasonable.

It should be noted that although the Appellant's initial ground for appeal also included concerns regarding public notice and consultation, as well as an allegation that the Plan is discriminatory in the treatment of wildlife as compared to livestock, it appears that these matters have been abandoned. In the event that they have not been abandoned, the Panel finds that the Appellant did not provide sufficient evidence or argument on these matters and, accordingly, these grounds for appeal are dismissed.

RELEVANT LEGISLATION

The Deputy Administrator's discretion to approve pest management plans is found in the following sections of the *Act*:

6 (3) The administrator

(a) may issue a permit or approve a pest management plan if satisfied that

(i) the applicant meets the prescribed requirements, and

(ii) the pesticide application authorized by the permit or plan will not cause an unreasonable adverse effect, and

(b) may include requirements, restrictions and conditions as terms of the permit or pest management plan.

...

12 (2) The administrator has the powers necessary to carry out this Act and the regulations and, without limiting those powers, may do any of the following:

(a) determine in a particular instance what constitutes an unreasonable adverse effect;

...

(b.1) suspend, amend, revoke or refuse to approve a pest management plan;

...

13 (1) The administrator may revoke, or suspend for the time the administrator considers appropriate, a licence, permit, certificate or approved pest management plan if the administrator considers

(a) that this Act, a regulation or a term of the licence, permit, certificate or pest management plan is not being complied with, or

(b) that the holder is applying, has applied or is handling a pesticide in a manner that is likely to cause or has caused an unreasonable adverse effect.

Section 1 of the *Act* contains the following definitions, which are relevant to this appeal:

"adverse effect" means an effect that results in damage to humans or to the environment;

...

"integrated pest management" means a decision making process that uses a combination of techniques to suppress pests and that must include but is not limited to the following elements:

(a) planning and managing ecosystems to prevent organisms from becoming pests;

(b) identifying potential pest problems;

(c) monitoring populations of pests and beneficial organisms, pest damage and environmental conditions;

(d) using injury thresholds in making treatment decisions;

(e) reducing pest populations to acceptable levels using strategies that may include a combination of biological, physical, cultural, mechanical, behavioural and chemical controls;

(f) evaluating the effectiveness of treatments;

...

"pest management plan" means a plan that describes

(a) a program for controlling pests or reducing pest damage using integrated pest management, and

(b) the methods of handling, preparing, mixing, applying and otherwise using pesticides within the program;

DISCUSSION AND ANALYSIS

1. What is the appropriate test to be applied when determining whether the use of pesticides under a pest management plan will cause an unreasonable adverse effect?

Section 6(3) of the *Act* states that an administrator may issue a pesticide use permit or approve a pest management plan if satisfied that:

(i) the applicant meets the prescribed requirements, and

(ii) the pesticide application authorized by the permit or plan will not cause an unreasonable adverse effect;

Section 1 of the *Act* defines "adverse effect" as "an effect that results in damage to humans or to the environment."

In deciding appeals of pesticide use permits and pest management plans, the Board applies a two-step test to determine whether the use of pesticides under a permit or plan will cause an "unreasonable adverse effect." This test was developed by the BC Court of Appeal in *Canadian Earthcare Society v. Environmental Appeal Board* (1988), 3 C.E.L.R. (N.S.) 55 (hereinafter *Canadian Earthcare*), and by Justice Legg of the BC Supreme Court in *Islands Protection Society v. British Columbia Environmental Appeal Board* (1988), 3 C.E.L.R. (N.S.) 185 (hereinafter *Islands Protection*).

The Board recently summarized that two-step test, and the case law from which it is drawn, in *Ecological Health Alliance et al. v. Deputy Administrator, Pesticide Control Act* (Appeal Nos. 2004-PES-002(a), 2004-PES-004(a), and 2004-PES-005(a)), [2004] B.C.E.A. No. 10 (Q.L.), as follows:

> [A]t the federal level, the *Pest Control Products Act*, R.S.C. 1985, P.-9 requires a pesticide to be registered before that pesticide can be sold or imported into Canada. It also provides that the pesticide must be used in accordance with its label. The onus is on the applicant to submit all relevant studies to the federal government to show that its product does not cause an "unacceptable risk of harm to public health,

> plants, animals and the environment" (*Pest Control Products Regulations*, section 18(d)(ii)), before a decision is made to register a pesticide.
>
> The British Columbia Court of Appeal has ruled that the Environmental Appeal Board can consider a registered pesticide to be generally safe when used in accordance with the label (*Canadian Earthcare* ...). However, it is also clear that the fact that a pesticide is federally registered does not mean that it can never cause an unreasonable adverse effect.
>
> ...
>
> The Court of Appeal decision in *Canadian Earthcare* ... supported Justice Lander's finding, in the court below, that:
>
> > Should the Board find an adverse effect (i.e. some risk) it must weigh that adverse effect against the intended benefit. Only by making a comparison of risk and benefit can the Board determine if the anticipated risk is reasonable or unreasonable. Evidence of silvicultural practices will be relevant to measure the extent of the anticipated benefit. Evidence of alternative methods will also be relevant to the issue of reasonableness. If the same benefits could be achieved by an alternative risk free method then surely the use of the risk method would be considered unreasonable.

In *Islands Protection*, issued shortly after the decision in *Canadian Earthcare*, Justice Legg summarized the two-stage test from *Canadian Earthcare* as follows:

> The first stage was to inquire whether there was any adverse effect at all. If not, that was the end of the necessary inquiry. The second stage was if the Board decided that an adverse effect existed, then the Board had to undertake a risk-benefit analysis to ascertain whether that adverse effect was reasonable or unreasonable.

Thus, the two-step test involves first determining whether the authorized pesticide use will cause an adverse effect, namely, "some risk" of an effect that results in damage to humans or to the environment. If so, then the second stage involves a risk-benefit analysis to determine whether the adverse effect is "unreasonable."

In *Wier v. Environmental Appeal Board et al.* 2003 BCSC 1441 (hereinafter *Wier*), Justice Ross confirmed that the Board may consider evidence of the general toxicity of a pesticide, despite the fact that a pesticide has been federally registered, in determining whether a pesticide use will have an adverse effect.

The Appellant argues that the Board should not apply the two-step test to a pest management plan approval since that test was developed for appeals of pesticide use permits, which are usually site-specific. The Appellant submits that pest

management plans are not site-specific; rather, they contain a decision-making process that sets out how the plan holder will decide where and when to use pesticides. The Appellant submits that, since no "particular" or site-specific pesticide treatment is authorized by a plan, the two-step test is inappropriate.

Instead, the Appellant submits that the appropriate test for evaluating an approval of a pest management plan should be whether the "decision-making matrix" set out in the plan contains sufficient safeguards to prevent the plan holder from making decisions that will cause an unreasonable adverse effect. However, within that decision-making matrix, the two-step test is applicable. Specifically, the decision-making matrix or process set out in a plan should ensure that the plan holder will go through the test each time a decision is made to apply a pesticide at a particular site.

The Appellant submits that, when the Legislature added pest management plans to the *Act* in 1997, it apparently retained the same test that had applied to permits, namely, the "unreasonable adverse effect" test set out in section 6(3) of the *Act*. However, the Appellant submits that the two-step test was developed prior to the 1997 amendments, and that the advent of plans requires a new interpretation of section 6(3) of the *Act*. According to the Appellant, that new interpretation seems to be as follows:

> 1) when the administrator evaluates a pest management plan, he or she is to be reasonably satisfied that the two-step test is contained within the decision-making matrix (process) set out in the plan so that, if followed by the plan holder, the subsequent application of pesticides will not cause an unreasonable adverse affect under section 6(2) of the *Act*.
>
> 2) when the Board evaluates an administrator's approval of a plan, the Board is to determine whether the administrator could reasonably have been satisfied that the decision-making matrix (or process) within the plan would prevent the plan holder from making decisions under the plan that would result in an unreasonable adverse effect.

The Deputy Administrator and the MOF acknowledge that the two-step test was originally developed for pesticide use permits, before the inclusion of pest management plans in the *Act*. They submit, however, that the Board has applied the test to the approval of pest management plans in previous decisions, as noted by the Appellant, and should do so in this case. They submit that the Board should not reverse an approval of a plan unless the appellant shows, on a balance of probabilities, that the pesticide treatments authorized in a plan will have an unreasonable adverse effect.

Panel's findings

The Panel has considered whether the relevant provisions of the *Act* provide that the words "unreasonable adverse effect" in section 6(3) should be interpreted, with regard to plan approvals, in the way that is suggested by the Appellant; namely, that the Board should focus on the decision-making matrix within a plan that is to

be followed by the plan holder, as opposed to focusing on the factual information about the area of the plan itself and whether the application of pesticides on the proposed treatment sites will result in an unreasonable adverse effect.

Does the statutory language support the interpretation that is asserted by the Appellant?

Essentially, the Appellant argues that the phrase "unreasonable adverse effect" in section 6(3)(a)(ii) of the *Act* should be interpreted and applied differently for plans than for permits. However, the Appellant points to no statutory language to support a "new" interpretation of the language in section 6(3)(a)(ii) that would be applied to plans but not to permits. The Appellant simply notes that plans were added to the *Act* after the two-step test had been developed for assessing decisions to issue permits.

The Panel has reviewed the language in sections 6, 12, and 13 of the *Act* that pertains to permits and plans, as well as the definition of "adverse effect" in section 1 of the *Act*. In those provisions, there is no indication of an express or implied legislative intention to apply the phrase "unreasonable adverse effect" differently to plans than to permits.

The Panel finds that, if the Legislature had intended the phrase "unreasonable adverse effect" to have a different meaning for plans than for permits, it could have expressly said so in the definition of "adverse effect" or in the sections of the *Act* where the phrase "unreasonable adverse effect" is used in relation to plans and permits. The Legislature did not do so. The phrase "unreasonable adverse effect" in section 6(3)(a)(ii) of the *Act* applies to both plans and permits with no differences in wording. The definition of "adverse effect" also contains no language to indicate that an adverse effect under a permit is different from an adverse effect under a plan. Indeed, the Appellant acknowledges that when pest management plans were added to the *Act* in 1997, the Legislature retained the same test in section 6(3) that had previously applied to pesticide use plans. Additionally, under section 13(1)(b) of the *Act*, the phrase "unreasonable adverse effect" applies to both plans and permits with no differences in wording.

With regard to the assertion that the "decision-making matrix" or "process" set out in plans should be assessed under the "unreasonable adverse effect" test, the Panel notes that section 6(3)(a)(ii) of the *Act* expressly states that an administrator may approve a plan if satisfied that "*the pesticide application authorized by the permit or plan* will not cause an unreasonable adverse effect" [italics added]. This clearly indicates that it is the pesticide application authorized by a plan, and not the decision-making matrix set out in a plan, that must be considered by an administrator under section 6(3)(a)(ii). If the Legislature had intended administrators to examine whether the decision-making process set out in a plan will cause an unreasonable adverse effect, then the Legislature could have said so when it amended the *Act* in 1997. It did not. Thus, the Panel finds that, on an appeal of a plan, the Board must consider whether the pesticide application

authorized by the plan, and not the decision-making process set out in the plan, will cause an unreasonable adverse effect.

That is not to say that the decision-making process set out in a plan is not to be assessed. The Panel finds that the decision-making process set out in a plan is subject to a separate assessment that is set out in a different part of the *Act* than the "unreasonable adverse effect" test. Specifically, the decision-making process in a plan is to be considered when determining whether the plan meets the content requirements specified in the *Act*, which are set out in the definitions of "pest management plan" and "integrated pest management" in section 1 of the *Act*:

> "pest management plan" means a plan that describes a program
>
> (a) for controlling pests or reducing pest damage using *integrated pest management*, and…
>
> "integrated pest management" means *a decision making process* that uses a combination of techniques to suppress pests and that must include but is not limited to the following elements…
>
> [italics added]

Those definitions indicate that a pest management plan must, among other things, describe a program for controlling pests or reducing pest damage using a decision making process that uses a combination of techniques to suppress pests and includes the required elements. Thus, the Panel finds that the decision-making process set out in a plan must meet certain statutory requirements, but those requirements are separate from the "unreasonable adverse effect" test set out in section 6(3)(a)(ii) of the *Act*.

Does the case law support the interpretation that is asserted by the Appellant?

In *Canadian Earthcare*, *Islands Protection*, and *Wier*, the British Columbia courts have provided the Board with guidance in applying the "unreasonable adverse effect" test set out in the *Act*. In *Canadian Earthcare*, the Court of Appeal first enunciated the two-step "unreasonable adverse effect" test. The B.C. Supreme Court has subsequently applied and clarified that test in *Islands Protection* and *Wier*.

The Panel finds that the Appellant's submissions do not support its position that a different approach to the two-step test should be applied to plans. However, the Panel has carefully reviewed those cases for any indication that a different approach should be taken when assessing plans as opposed to permits.

The Panel finds that although *Canadian Earthcare* and *Islands Protection* were decided before plans were added to the *Act*, and *Wier* dealt with an appeal of a permit, not a plan, the key findings in those cases turn on the Courts' interpretation of the phrase "unreasonable adverse effect" in section 6(3) of the *Act*, as well as the definition of "adverse effect." As such, the Panel finds that the Courts' findings

regarding the proper interpretation of "unreasonable adverse effect," and the appropriate test to be applied in appeals under the *Act*, are equally applicable to pesticide use permits and pest management plans.

Is the two-step test that is applied by the Board inappropriate for plans because it requires site-specific information that is generally not found in plans?

The Appellant challenges the two-step test on the basis that (1) plans are not site-specific, and (2) the two-step test applied by the Board is site-specific. Therefore, the test is ill suited for plans.

The Panel notes that neither section 6(3)(a)(ii) nor the definition of "adverse effect" expressly indicate that an administrator needs to be satisfied that a pesticide application under a permit or plan will not cause an unreasonable adverse effect at a specific site. However, section 12(2)(a) of the *Act* states that an administrator may "determine *in a particular instance* what constitutes an unreasonable adverse effect" [italics added]. Two differences between the language in sections 12(2)(a) and 6(3)(a)(ii) are notable.

First, section 6(3)(a)(ii) only applies to the process of considering whether to issue a permit or approve a plan, while section 12(2)(a) has a much broader application. Section 12(2)(a) empowers an administrator to determine, at any time that he or she is exercising powers necessary to carry out the *Act* and the regulations, what constitutes an unreasonable adverse effect. That broad discretion may be exercised in the course of deciding whether to approve a plan, or in the course of amending, suspending or revoking a plan that has already been approved.

Second, section 12(2)(a) expressly includes the phrase "in a particular instance," and section 6(3)(a)(ii) does not. Since the phrase "particular instance" is not defined in the *Act*, the Panel has considered the plain meaning of the words "particular" and "instance." The *Merriam Webster Collegiate Dictionary* defines the adjective form of "particular" as "of, relating to, or being a single person or thing." It defines the noun form of "instance" as "a step, stage, or situation viewed as part of a process or series of events," and explains that instance "applies to any individual person, act, or thing that may be offered to illustrate or explain."

Thus, when sections 6(3)(a)(ii) and 12(2)(a) are considered together, the Panel finds that administrators may, in the course of exercising their statutory powers, including their discretion to approve a plan, determine what constitutes an unreasonable adverse effect "in a particular instance," such as at a single place and/or time, or in response to an individual incident. Similarly, the Board has the discretion to consider site-specific evidence of an unreasonable adverse effect.

Indeed, the Board must consider each appeal on an individual basis, and must be able to assess all of the evidence that is relevant in each case. Evidence that a pesticide application under a plan or permit will cause an unreasonable adverse effect at a specific site will, in most cases, be an important consideration for the Board. Evidence of the applicant's ability to comply with the pesticide label (which contains general instructions for use) or evidence of the general toxicity of a

pesticide may also be relevant. Thus, the Board must have the discretion to consider not only site-specific and application-specific concerns, but also evidence of general toxicity, if such evidence is relevant in a particular case.

Furthermore, the Panel notes that the concept of a pesticide treatment "site," and what constitutes "site-specific" evidence, may vary from case to case, depending on the spatial scale of a particular permit or plan. Both plans and permits apply to specific geographic areas that are defined by boundaries, but plans generally apply to much larger areas than permits. As a result, the level of detail that will be required to establish a site-specific adverse effect in a given case may depend on the size of the geographic area covered by a particular permit or plan. Thus, the Panel does not agree with the Appellant that plans necessarily lack the "site-specific" information that is required to assess whether a pesticide application authorized under a plan will cause an unreasonable adverse effect. It is just to be assessed on a different scale.

In determining what evidence may be relevant to deciding whether a pesticide application under a plan will cause an unreasonable adverse effect, the Board should take a flexible approach. Such an approach is supported by the findings of Justice Ross in *Wier*, at paragraphs 30-32:

> [30] To my mind it is one thing to say that the Board, relying upon the federal registration process, does not err in refusing in a particular case to address evidence of toxicity, and another to say that it would err if it chose to consider such evidence. In other words, the decision in ***Earthcare*** that the Board did not fall into error failing to undertake an inquiry it was obliged to undertake, does not, in my view, mean that the Board is prohibited in every case from such an inquiry.
>
> [31] In my view the Board, in its discretion, is entitled to consider such evidence. It may well be that in the vast majority of cases there would be no reason for the Board to go beyond the fact of federal registration in relation to issues of general toxicity. However, there are situations in which consideration of evidence in relation to general toxicity of a pesticide that has received federal registration could be important in the analysis of possible adverse effects. One example would be where new evidence relating to toxicity that is not specific to the site in question, has become available only after the federal process was complete.
>
> [32] In my view, neither the language of the ***Act*** nor the decision of the Court in ***Earthcare*** would preclude the Board from considering such evidence in such a circumstance. The ***Act*** contains no language that would require the Board exclude from its consideration in all cases evidence relating to toxicity. The reasons of Lander J. [that were approved by the Court of Appeal in *Earthcare*] provide examples of the kind of inquiry that the Board did undertake, but did not purport to provide an exhaustive list of permissible inquiries.

[underlining added]

The reasons of Justice Lander that are referred to in paragraph 32 of *Wier* are found at paragraph 12 of his decision, and state as follows:

> It is important to bear in mind that the Board did not state that a federally registered pesticide could never cause an unreasonable adverse effect. The Board was willing to hear evidence on toxicity to the extent that the evidence showed that the specific site in question prevented safe application of the pesticide. They further heard evidence whether the proposed pesticide use was contrary to registration intent and restrictions or that the permit holder was unable to apply the pesticide safely.
>
> [underlining added]

Those decisions confirm that the Board has a broad discretion in hearing appeals under the *Act* to consider all relevant evidence, and is not limited to considering site-specific evidence. Consequently, the Panel rejects the Appellant's submission that the two-step test is inappropriate for plans because it is limited to site-specific evidence that a pesticide application will cause an unreasonable adverse effect. While site-specific evidence will usually be relevant in appeals under the *Act*, the Board has the discretion to consider evidence of general toxicity if such evidence is relevant. Furthermore, what constitutes "site-specific" evidence may vary from one case to another, depending on the size of the area in which pesticide use is authorized.

For all of these reasons, the Panel finds that the two-step test that has been previously applied by the Board is appropriate for determining whether a pesticide use authorized by a plan will cause an unreasonable adverse effect.

What is the appropriate evidentiary burden for appellants?

Under section 6(3) of the *Act*, the administrator "may issue a permit or approve a pest management plan *if satisfied that* ... (ii) the pesticide application authorized by the permit or plan will not cause an unreasonable adverse effect..." [emphasis added].

The Appellant suggests that the use of the word "satisfied" in section 6(3) of the *Act* indicates an intention that the standard of proof should be flexible and should vary with the nature of the issue and its gravity, rather than an intention to always apply the standard of "a balance of probabilities."

The Panel finds that the "balance of probabilities" standard, as opposed to the standard of "beyond a reasonable doubt," is the evidentiary standard that applies to the administrative appeal proceedings before the Board as they do not involve criminal or quasi-criminal sanctions. This approach is confirmed in *Langeth Estate v. Gardiner* [1990], M.J. No. 543 at pp. 9-10, the Manitoba Court of Appeal case cited by the Appellant. In that case, the Court applied the balance of probabilities

standard, based on the use of the word "satisfied" in an applicable statute, in a case involving the intent of a will. At page 10, Philip J.A. stated as follows:

> Adopting the general rule of evidence that the standard of proof should vary with the nature of the issue and its gravity, I am persuaded that nothing in the circumstances of this case requires a higher standard of proof than proof on a balance of probabilities to establish testamentary intent.

Summary of the Panel's findings

To summarize, the Panel finds that the relevant provisions of the *Act* provide that an administrator may approve a plan if (1) the plan contains the content required by the *Act*, including a decision-making process that meets the statutory requirements; and (2) the administrator is satisfied that the pesticide application authorized by the plan will not cause an unreasonable adverse effect.

The Panel further finds that the two-step "unreasonable adverse effect" test that has previously been applied by the Board is appropriate for assessing plans under section 6(3)(b)(ii) of the *Act*. Specifically, in an appeal of a plan, an appellant has the onus of establishing, on a balance of probabilities, that a pesticide application under a plan will cause an unreasonable adverse effect. In deciding such appeals, the Board has the discretion to consider all evidence that is relevant in the circumstances of each case, including site-specific evidence.

2. Whether the Deputy Administrator improperly delegated his discretion in approving the Plan.

The Appellant maintains that, with the advent of pest management plans, the authority granted to an administrator under section 6(3) of the *Act* to issue site-specific permits is improperly sub-delegated to a plan holder who must make site-specific decisions in accordance with the terms and conditions of a plan. The Appellant submits that statutory powers can only be delegated under strict conditions that dictate the manner in which the sub-delegatee makes decisions. Otherwise, the person to whom the power was given has failed to exercise their discretion and has merely passed the power on to someone not authorized to exercise that power.

The Deputy Administrator and the MOF submit that the principle of unauthorized sub-delegation of statutory powers does not apply in this case, because the Deputy Administrator is not delegating any of his powers in approving the Plan. They maintain that the *Act* specifically allows the approval of a pest management plan to authorize pesticide treatments. Section 6(3) of the *Act* sets out the test for an administrator (or a deputy administrator) to approve pest management plans. They submit that it is entirely within the administrator's discretion to approve a plan provided that the requirements of that section are met.

They also maintain that, although plans may not contain the site-specific information that permits have, plans are not a delegation of the administrator's

powers. In approving a plan, an administrator must be satisfied that the plan meets all prescribed requirements, and that the pesticide treatments authorized by the plan will not cause an unreasonable adverse effect.

The Deputy Administrator and the MOF submit that, in approving a plan, an administrator is doing what she or he is authorized to do under the legislation; namely, to provide a general guide for the application of pesticides in an area. They maintain that the treatments applied under plans are continually monitored, and an administrator retains the power, under sections 12 and 13 of the *Act*, to take necessary actions to prevent unreasonable effects from occurring during the term of a plan.

The Panel notes that sections 6(3)(a)(ii), 12(2), and 13(1)(b) of the *Act* expressly state that it is administrators, and not plan holders, who have the discretion to approve plans and to determine whether a pesticide application will cause an unreasonable adverse effect. The Panel finds that there is no indication in those provisions that the Legislature intended for such determinations to be delegated to plan holders.

The Panel further finds that the Appellant has provided no evidence that, in this case, the Deputy Administrator sub-delegated his statutory authority under section 6(3) of the *Act* to the Plan Holder when he approved the Plan.

3. Whether the Plan meets the statutory content requirements for pest management plans under the *Act*.

The Appellant submits that a pest management plan must meet the content requirements set out in the definitions of "pest management plan" and "integrated pest management" in section 1 of the *Act*. The Appellant argues that the Plan refers to integrated pest management and lists the mandatory elements of integrated pest management, but does not show that each element is included in it. In particular, the Appellant argues that the Plan does not comply with three of the six required elements of integrated pest management, namely:

(a) planning and managing ecosystems to prevent organisms from becoming pests;

(b) identifying potential pest problems;

...

(e) reducing pest populations to acceptable levels using strategies that may include a combination of biological, physical, cultural, mechanical, behavioural and chemical controls;

The Appellant maintains that, in a forestry context, the content requirements provide that if a person wishes to use a pesticide under a pest management plan, he or she must identify pest problems prior to any logging (element (b)), and then he or she must plan and manage forest ecosystems, through methods such as the

choice of logging techniques and silviculture systems, to prevent competing vegetation from becoming a pest (element (a)). In areas known to be prone to competing vegetation, this may mean using alternatives to clear-cut logging to reduce competing vegetation (element (e)).

According to this interpretation of the requirements, the Appellant argues that the Plan fails to meet:

- element (a) because the list of "Preventative Measures" set out in section 3.7 of the Plan does not include any pre-logging assessments or ecosystem planning. Rather, the Plan assumes that clear-cut logging followed by conifer plantations is the only silviculture system that will be used;

- element (b) because section 3.8 of the Plan does not prescribe any site assessment until at least 2 years after conifer seedlings have been planted; and

- element (e) because section 3.6 of the Plan proposes only 2 vegetation management strategies, namely, pesticide control and manual/mechanical control.

In addition, the Appellant argues that, in order to comply with the content requirements for a pest management plan, the plan holder must have the authority to plan and manage each required element of integrated pest management, and for a government plan holder, this means having the necessary statutory or delegated authority to do those things. The Appellant maintains that, in this case, the identity of the applicant for the Approval is not expressly indicated, and it is not clear if the Plan Holder has the proper authority. The Appellant notes that the Plan states that the Plan Holder is the "Ministry of Forests (Boundary Forest District)," but it does not state who within the forest district is the statutory decision-maker or under which legislation he or she exercises the forest management powers that require pesticide use. However, on review of the Plan as a whole, the Appellant submits that the likely holder of the Plan is the District Manager of the Boundary Forest District under the Small Business Forest Enterprise Program, and that, as such, he or she has the statutory authority to comply with the integrated pest management requirements set out in section 1 of the *Act*.

The Deputy Administrator and the MOF submit that the Deputy Administrator properly found that the Plan meets the content requirements set out in the *Act*. They submit that the Plan Holder is Her Majesty the Queen in right of British Columbia as represented by the Minister of Forests, and that the Minister of Forests has clear authority to undertake the integrated pest management strategies contemplated under the Plan. In this regard, they refer to section 4 of the *Ministry of Forests Act*, R.S.B.C. 1996, c. 300, which states as follows:

> **4** The purposes and functions of the ministry are, under the direction of the minister, to do the following:

> (a) encourage maximum productivity of the forest and range resources in British Columbia;
>
> (b) manage, protect and conserve the forest and range resources of the government, having regard to the immediate and long term economic and social benefits they may confer on British Columbia;
>
> (c) plan the use of the forest and range resources of the government, so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated, in consultation and cooperation with other ministries and agencies of the government and with the private sector;

Moreover, the Deputy Administrator and the MOF submit that the Plan contains all of the elements of integrated pest management set out in section 1 of the *Act*. Specifically, they submit that section 3.2 of the Plan addresses element (b) of the definition because it expressly identifies the plant species that are considered potential pests. Section 3.2 also explains why those plants are potential pests in relation to planted trees, and that the "degree of competition from any of these species will vary from site to site and will be assessed and prepared on each detailed site assessment (DSA)."

The Deputy Administrator and the MOF submit that section 3.7 of the Plan addresses element (a) of the definition of "integrated pest management." They argue that the Appellant incorrectly assumes that "clear-cut logging followed by conifer plantations is the only silviculture system that will be used." They submit that the Plan specifically acknowledges that preventing pest species from injuring or killing regenerated stands may require several techniques and methods. They note, for example, that section 3.7 of the Plan states that "one of the first steps in the vegetation management program is the selection of silviculture system." They submit that different silviculture systems, such as clear-cut, patch tree, seed tree, or shelterwood, will be utilized in the Plan area depending on the type of soil and terrain, the nature and extent of pest species, and the other resource and environmental values that may be found at a site. They also note that section 3.7 lists a number of preventative, non-chemical measures that the MOF has undertaken, and will continue to undertake, to help avoid problems with competing vegetation.

The Deputy Administrator and the MOF submit that sections 3.3 and 3.6 of the Plan addresses element (e) of the definition of "integrated pest management." They note that element (e) of the definition states that the reduction of pest populations to acceptable levels "may include," not "must" include, a combination of different methods of pest control. However, they note that section 3.3 of the Plan illustrates that, from 1997 to 2001, the MOF used a variety of different methods to control pests in the Plan area, including manual brushing and weeding, mechanical

brushing and weeding, prescribed burning, and mechanical girdling as well as pesticides. They also note that the Technical Report prepared by the Deputy Administrator when he considered whether to approve the Plan refers to the MOF's pest management practices in the Plan area over the past 5 years, and indicates that the MOF used non-chemical vegetation control methods on 1015.8 hectares versus pesticide treatments on 427.5 hectares over that time period. Additionally, they note that section 3.6 of the Plan describes the MOF's intention to continue to use various non-chemical and chemical vegetation control methods under the Plan.

The Appellant replies that the Plan does not meet element (a) of the definition of "integrated pest management" because it does not contain information about the different silviculture systems that could be used in areas covered by the Plan, or how those systems would prevent unwanted plants from becoming pests. The Appellant argues that such information must be in the Plan in order for the Deputy Administrator to properly consider alternatives to pesticides when he decides whether any adverse effect is unreasonable. The Appellant further submits that the Plan does not meet element (b) because its identification of the plants that are considered to be pests is incomplete and imprecise. Specifically, section 3.2 of the Plan only lists "Some of the dominant and most competitive" plant species. Furthermore, the Plan does not contain information such as maps of ecosystem types which would enable the Deputy Administrator to properly assess any adverse effects arising from the Plan. Finally, the Appellant maintains that the Plan does not meet element (e) because it focuses only on physical and chemical methods to remove pest plants after logging, and fails to give serious consideration to various pre-logging planning techniques for controlling pest vegetation.

Panel's findings

Who holds the Plan and what area does the Plan apply to?

The Approval was issued to the "Minister of Forests, BC Timber Sales, Kootenay Business Area," and is in reference to an MOF Plan submission that applies to "the Ministry of Forests' integrated vegetation management program on crown land within the Boundary TSA." Appendix 4 of the Plan contains a map of the area. Thus, the Panel finds that the Plan applies to Crown land within the Boundary TSA, as described in the Approval and the Plan. The Panel finds that the Plan Holder is Her Majesty the Queen in right of British Columbia, as represented by the Minister of Forests. The Plan is administered by the MOF staff within BC Timber Sales' Kootenay Business Area as part of the silviculture activities undertaken when Crown land within the Boundary TSA is harvested. Section 5.11 of the Plan states that an MOF official will sign the Plan to acknowledge the MOF's commitment to comply with the Plan, and that treatment decisions under the Plan will be made by "qualified Ministry staff or by individuals reporting directly to qualified ministry staff, who will confirm their decisions."

The Panel notes that the Plan was submitted by the former Boundary Forest District of the MOF, but is held by the "Minister of Forests, BC Timber Sales, Kootenay Business Area." This is because the MOF completed a re-organization of both its

districts and its administration of TSA's between the time when the Plan was submitted to the Deputy Administrator, and when the Approval was issued. Specifically, the evidence is that the Boundary TSA was located within the Boundary Forest District when the MOF submitted the Plan for approval. Effective April 1, 2003, the MOF reorganized its forest districts, and the Boundary Forest District was eliminated and replaced with the Arrow Boundary Forest District. Thus, the Boundary TSA was located within the Arrow Boundary Forest District when the Deputy Administrator issued the Approval. In addition, when the Plan was submitted, the Boundary TSA was administered by the Boundary Forest District's Small Business Forest Enterprise Program. Effective April 1, 2003, TSA's came under the administration of BC Timber Sales, a new organization within the MOF that is financially independent from forest districts and regions. Thus, when the Approval was issued, the Boundary TSA was administered by the Kootenay Business Area of BC Timber Sales, which geographically includes, but operates separately from, the Arrow Boundary Forest District.

Does the Plan contain all of the elements listed in the definition of integrated pest management?

- *Element (a) – planning and managing ecosystems to prevent organisms from becoming pests*

The Panel finds that section 3.7 of the Plan addresses element (a) of the definition of "integrated pest management." Contrary to the Appellant's belief that clear-cut logging followed by conifer plantations is the only silviculture system that will be used, section 3.7 of the Plan specifically states that:

> One of the first steps in the vegetation management program is the selection of silviculture system. The choice of system - clear-cut, patch cut, seed tree, etc. - impacts the manner and nature of regeneration, the method of harvesting, and the post harvest conditions of light, moisture and seed. All these factors can impact the future levels of brush competition on the block.

The Panel also notes that section 3.7 lists a number of preventative, non-chemical measures that the MOF will continue to undertake to help avoid problems with competing vegetation. They are:

- matching seedling stock type to the reforested area;
- planting seedlings that establish quickly;
- integrating seedling stock type with reforestation variables such as planting time, site ecology, and silviculture system;
- using good planting practices to reduce seedling shock and mortality;

- establishing good Micro sites (that are elevated above water and receive more sun) for seedlings, which can play a key role in whether brushing treatments will be needed in the future.

As such, the Panel finds that the Plan adequately explains how the MOF intends to plan and manage ecosystems in the Plan area to prevent organisms from becoming pests.

- *Element (b) – identifying potential pest problems*

The Panel finds that the Plan adequately addresses element (b) of the definition of "integrated pest management." Although section 3.2 only lists some of the plant species that are considered the most dominant and competitive in relation to desirable conifers, the Panel notes that element (b) does not specify that a plan must contain a comprehensive list of every potential pest species. The Panel also notes that section 3.2 explains, in general, why those plants are potential pests in relation to conifers, and that the "degree of competition from any of these species will vary from site to site and will be assessed and prepared on each detailed site assessment (DSA)."

- *Element (e) – reducing pest populations to acceptable levels using strategies that may include a combination of biological, physical, cultural, mechanical, behavioural and chemical controls*

The Panel finds that the Plan addresses element (e) of the definition of "integrated pest management." As noted by the Deputy Administrator and the MOF, element (e) states that the reduction of pest populations to acceptable levels "may include," not "must" include, a combination of different methods of pest control. Nevertheless, section 3.3 of the Plan illustrates that, from 1997 to 2001, the MOF used a variety of different methods to control pests in the Plan area, including manual brushing and weeding, mechanical brushing and weeding, prescribed burning, and mechanical girdling as well as pesticides. Additionally, section 3.6 of the Plan describes the MOF's intention to continue to use various non-chemical and chemical vegetation control methods under the Plan. The Panel also notes that pre-logging planning techniques and preventative measures for controlling pest vegetation are addressed in section 3.7 of the Plan, as discussed above.

In summary, the Panel finds that the Plan meets the content requirements that are specified in the *Act* with regard to pest management plans.

4. Whether the use of pesticides in accordance with the approved Plan will have an adverse effect?

The Appellant argues that the standard to be met for "adverse effect" is a low one, in that there only need be evidence of "some risk" to humans or the environment (*Canadian Earthcare Society* and *Wier*).

The Appellant submits that the Plan will cause an adverse effect on grizzly bears within the Plan area, including harm associated with direct exposure and ingestion

of pesticides, loss of food plants, and loss of security cover provided by plants. The Appellant maintains that the grizzly bear population in the area is at high risk of extirpation given the potential effects of pesticide use on the area's small grizzly bear population, estimated at 26 to 38 bears, of which 3 to 6 may be adult breeding females.

The Appellant notes that section 2.5 of the Approval contains a condition directed at minimizing livestock exposure to pesticides. The Appellant submits that any adverse effect on domestic animals would also, presumably, be felt by wild animals. Moreover, the Appellant submits that the Board has found in several previous cases, including *Northwest BC Coalition*, that the use of glyphosate on plants eaten by wildlife would adversely affect wildlife.

The Appellant produced a report by Dr. Brian Horejsi, whom the Appellant tendered as an expert in grizzly bear ecology and grizzly bear management. The Panel notes that Dr. Horejsi has a Ph.D in Behavioral Ecology/Mammalogy, and has authored or co-authored several published and unpublished reports on grizzly bear habitat and population management for non-profit organizations.

The Panel accepts that Dr. Horejsi is an expert in grizzly bear ecology and grizzly bear population management. However, the Panel notes that he is not an expert in chemistry or toxicology.

The Appellant submits that Dr. Horejsi's report provides evidence that glyphosate has an adverse effect on grizzly bears through direct ingestion and contact, loss of food plants, and loss of security cover. In his report, Dr. Horejsi states:

> Tissue irritation by glyphosate exposure in bears is likely to be similar to that seen in humans… A bear feeding on glyphosate treated plants cannot avoid eye exposure, which has been reported to result in irritation, pain, burning, and blurred vision.
>
> … Bears "make a living with their nose" and impaired sense of smell, combined with eye irritation and reduced vision, would lead to an inability to detect food sources through odor and perhaps an inability to determine food quality and condition. This syndrome would result in an inability to or delay in foraging, leading to reduced caloric intake and subsequent impact on body condition.
>
> … It should be expected that as leaf tissue is damaged and plants [treated with glyphosate] begin to die, conditions that occur within one to two days of application, green forage would begin to turn brown and berries would begin to fall… As plant and fruit damage advances, forage consumption by bears can be expected to drop and palatability of remaining damaged vegetation and fruit would be reduced, leading to some fairly low threshold point at which bear(s) would abandon use of the site…

> … Security for bears is partially dependent on vegetation screening which limits exposure to stimuli like movement, visual contact, and sound, most of which are associated with and generated by road access. Herbicide treatment can impact this aspect of bear behavior by removing or reducing cover (Hamilton et al. 1990) and limiting its recovery.

Dr. Horejsi notes that a female bear's ability to reproduce is related to a threshold body weight, and that body weight would be reduced if food intake were impaired by irritation from direct contact with pesticides, loss of food plants, and loss of security cover.

Finally, the Appellant argues that the nature and gravity of the possible adverse effects of pesticide use should be considered in a manner consistent with the precautionary principle.

The Deputy Administrator and the MOF submit that there is no evidence that the use of pesticides under the approved Plan will have an adverse effect on grizzly bears or grizzly bear habitat. They submit that Dr. Horejsi's report does not definitively state that glyphosate will have an adverse effect on grizzly bears through ingestion and contact. Rather, he theorizes that, if a bear comes in direct contact with glyphosate, it is likely to have some sort of adverse effect on that particular bear.

In support of their submissions, the Deputy Administrator and the MOF rely on two reports: one by Dr. Frank N. Dost, who they tender as an expert in agricultural chemistry and forest toxicology; and one by Dr. Bruce N. McLellan, who they tender as an expert in grizzly bear population dynamics, rates and causes of grizzly bear mortality, and grizzly bear distribution relative to habitat and human influence.

The Panel notes that Dr. Dost is a professor emeritus of agricultural chemistry and forest toxicology at Oregon State University, and the Panel accepts that he is an expert in those fields. The Panel notes that Dr. McLellan has a Ph.D in Wildlife Ecology and has been a Wildlife Research Ecologist with the Research Branch of the MOF since 1989. He has published numerous refereed journal articles on grizzly bear population dynamics and distribution. The Panel accepts that Dr. McLellan is an expert in grizzly bear population dynamics, rates and causes of grizzly bear mortality, and grizzly bear distribution relative to habitat and human influence.

With regard to potential effects on grizzly bears from direct exposure to glyphosate, Dr. Dost's report states as follows:

> … the potential direct toxicologic impact of glyphosate use in site preparation or other reforestation activity on any species will be undetectable, whether as some kind of immediate effect, or as longer-term systemic, reproductive or genetic impact… .
>
> It is implied [by Dr. Horejsi] that either contact with or ingestion of glyphosate "could" cause weight loss and jeopardize survival. There is

> no stated evidence for such a prospect, no indication of potential exposure and dose that might be experienced by the animals, and no consideration of the dose/response and expected risk associated with such impact. The references quoted speak to effects of weight loss, not effects of glyphosate….
>
> Eye irritation is possible for users of the herbicide if the concentrated material is splashed in the eyes. The diluted material as applied is not irritant, and once deposited on foliage and dried it does not dislodge.
>
> Assertions are made that disabling behaviour and sensory changes may occur in bears (and presumably other residents) after application of glyphosate. This contention is inconsistent with the experimental data, with the experience of even heavily exposed human applicators (who are able to report and describe such experience), and with extensive field observation of smaller mammals in treated plots.

Dr. Dost's report also states that glyphosate is tightly bound to plants and soil once it dries, which occurs in a short time. He advises that glyphosate does not accumulate in the body and is excreted quickly, unchanged.

With regard to potential effects on grizzly bear habitat, the Deputy Administrator and the MOF submit that Dr. McLellan's report indicates that most cutblocks will not produce enough bear food to be of value to grizzly bears, and that it is very difficult to assess the effects of the authorized pesticide use on grizzly bear food sources or a particular grizzly bear population.

Dr. McLellan's report states as follows:

> … grizzly bears, being very large omnivores, require a relatively high density of food for the site to be worth while feeding at. Because of this minimum food density requirement, most cutblocks do not provide enough food to be used by grizzly bears….
>
> … In these blocks foresters should try to have the site return to a conifer forest as soon as possible to improve cover and security for grizzly bears…. If herbicides, as opposed to manual vegetation management or no vegetation management, are required to have conifers grow more quickly, then herbicides should have a small but beneficial effect on grizzly bears on these cutblocks. Application methods such as "hack and squirt" that target specific shrubs would ensure little damage is done to shrubs that are preferred foods for bears and other species. Occasionally, however, an abundance of bear foods, in particular fruiting shrubs, grow on cutblocks. On these exceptional sites, no vegetation management or very species specific vegetation management would be best for grizzly bears, particularly if human access can be reduced. So, each cut block, or even portion of a cutblock should be assessed for bear food production before a decision is made on how the site should be managed.

> The pest management plan for the Boundary Forest District covers 650,000 ha [hectares]. The proposal calls for treating approximately 40 ha/year with glyphosate over this area (Al Barclay, Area Forester, Boundary Forest District, personal communication). Of the 650,000 ha of the pest management plan, grizzly bears are currently found over approximately 112,000 ha. If the proposed amount of area to be treated using glyphosate is equal across the entire 650,000 ha, then on average, approximately 7 ha would be treated per year in the area where grizzly bears would be found. If care is taken to not use glyphosate in portions of the cutblocks in this area that have exceptional amounts of bear foods (fruiting shrubs) and to use methods such as "hack and squirt" that do not target these shrubs, then treating an average of 7 ha per year should not negatively affect the grizzly bear population in this area.

In reply, the Appellant submits that Dr. Dost's evidence does not consider recent scientific articles which indicate that very low doses of chemicals can be more harmful than moderate doses. In response to Dr. McLellan's evidence that most cutblocks do not produce enough food to attract grizzly bears, the Appellant submits that the Kootenay-Boundary Land Use Plan, July 1997, states that "early successional stages are valuable in producing grizzly bear foods."

With regard to the area covered by the Plan, the Appellant replies that section 1.1 of the Plan states that it applies to the Boundary Forest District which covers "about 650,000 Square hectres [sic] of land." However, the Approval states that it applies to "crown land within the Boundary TSA," which has the same boundaries as the Boundary Forest District but only includes about 580,000 hectares because it excludes forest lands that are not administered by the MOF. Of that area, the Appellant submits that about 50 percent, or 290,000 hectares, is suitable for timber harvesting, according to an MOF document concerning the Boundary TSA. The Appellant submits that, if the Plan only applies to BC Timber Sales planning areas, the area covered by the Plan is much smaller because those areas account for only about 23 percent of the timber volume within the Boundary TSA. If that is so, the Appellant submits that the density of pesticide applications is more intense than Dr. McLellan assumed, and, in any event, the locations of pesticide treatments remains unknown in relation to bear habitat.

The Panel notes that the Appellant did not provide a copy of the July 1997 Kootenay-Boundary Land Use Plan. In addition, the Panel notes that the Kootenay-Boundary Higher Level Plan Order dated October 26, 2002, found at Appendix 1 of the Plan, states in its preamble that it "establishes new Resource Management Zones and Objectives and cancels the previous Kootenay-Boundary Higher Level Plan Order dated January 31, 2001." Therefore, it is unclear whether the July 1997 Land Use Plan is still in effect, or whether its provisions are the same as those in the October 2002 Higher Level Plan Order.

Finally, the Appellant submits that, while Dr. Horejsi's evidence only addressed the direct effects of glyphosate, the indirect effects of habitat change apply to both glyphosate and triclopyr.

Panel's findings

The Panel finds that the Appellant has provided no evidence that the use of triclopyr, as authorized under the Plan, will have an adverse effect. Dr. Horejsi's evidence only addressed the effects of glyphosate. While the Appellant asserts that the indirect effects of habitat change apply to both glyphosate and triclopyr, the Appellant provided no evidence to support that assertion.

With regard to glyphosate, the Panel finds that that the Appellant has provided insufficient evidence to establish, on a balance of probabilities, that glyphosate will have an adverse effect on grizzly bears as a result of direct contact with, or ingestion of, the herbicide. Dr. Horejsi's report does not state that glyphosate will have an adverse effect on grizzly bears through ingestion and contact. Rather, he theorizes that, if a bear ingests or comes in direct contact with glyphosate, *it could* have some sort of adverse physical effect on the bear. He provides no evidence pertaining to grizzly bears to support that hypothesis. As noted by, Dr. Dost, the references quoted in Dr. Horejsi's report address the effects of weight loss due to a lack of food supply, not the direct effects from the injection of or exposure to glyphosate. Dr. Dost also states that Dr. Horejsi's assertions that disabling behaviour and sensory changes may occur in bears due to direct exposure to glyphosate are inconsistent with the experimental data, with the experience of even heavily exposed human applicators, and with field observation of smaller mammals in treated plots.

However, the Panel finds that the evidence of both Drs. Horejsi and McLellan indicates that the use of glyphosate, as authorized under the Plan, may cause an adverse effect on grizzly bears as a result of the loss of food plants that would be targeted by pesticide applications. Drs. Horejsi and McLellan both state that the Granby grizzly population is "small and endangered, consisting of an estimated 26 to 38 individuals." While Dr. McLellan states that most cutblocks do not provide enough food to be used by grizzly bears because they require a relatively high density of food, he acknowledges that "Occasionally… an abundance of bear foods, in particular fruiting shrubs, grow on cutblocks." He then states that:

> *On these exceptional sites, no vegetation management or very species specific vegetation management would be best for grizzly bears*, particularly if human access can be reduced. So, each cut block, or even portion of a cutblock should be assessed for bear food production before a decision is made on how the site should be managed.

> … *If care is taken to not use glyphosate in portions of the cutblocks in this area that have exceptional amounts of bear foods (fruiting shrubs)* and to use methods such as "hack and squirt" that do not target these shrubs, then treating an average of 7 ha per year should not negatively affect the grizzly bear population in this area.
>
> [italics added]

It is clear that the pesticide use under the Plan may target plants that produce forage for grizzly bears. Fruit-producing plants such as elderberry and thimbleberry are listed in section 3.2 of the Plan as some of the dominant and most competitive plants.

Similarly, Dr. Horejsi states in his report that a female bear's ability to reproduce is related to a threshold body weight, and that body weight would be reduced if food intake was impaired by irritation from direct contact with pesticides, loss of food plants, and loss of security cover.

The Panel finds that, when those parts of the reports of Drs. McLellan and Horejsi are considered together with the fact that the Granby grizzly bear population is "small and endangered," there is sufficient evidence of an adverse effect on grizzly bears. Namely, there is "some risk" of harm to grizzly bears, and particularly breeding female bears, as a result of the loss of food plants. Accordingly, the Panel has considered whether that adverse effect is unreasonable.

5. If so, whether the adverse effect is unreasonable.

In *Canadian Earthcare Society*, the Court of Appeal states:

> Should the Board find an adverse effect (i.e. some risk) it must weigh that adverse effect against the intended benefit. Only by making a comparison of risk and benefit can the Board determine if the anticipated risk is reasonable or unreasonable. Evidence of silvicultural practices will be relevant to measure the extent of the anticipated benefit. Evidence of alternative methods will also be relevant to the issue of reasonableness. If the same benefits could be achieved by an alternative risk free method then surely the use of the risk method would be considered unreasonable.

The Appellant argues that risk of extirpation of the grizzly bear population in the area outweighs any benefits associated with the pesticide use, taking into account evidence of alternative control methods and silviculture practices. The Appellant argues that the Plan does not consider any silviculture methods, such as alternative harvesting methods, which would change the post-harvest conditions in cutblocks.

Specifically, the Appellant submits that the risks to grizzly bears, and proper protective measures to mitigate those risks, are not documented with sufficient detail in the Plan to satisfy the Deputy Administrator that the risks will be reduced to a reasonable level. The Appellant argues that the protective measures for grizzly

bears set out in section 6.2.2 of the Plan have no effect because they address aerial spraying, which is not authorized under the Plan, and they refer to "areas designated as moderate, or high value grizzly bear habitat as noted in a Land Resource Management Plan," and no such areas have been designated in the Kootenay-Boundary Higher Level Plan Order found at Appendix 1 of the Plan.

In addition, the Appellant submits that the use of operating zones has no practical effect because the map accompanying the Plan shows that the entire area is designated as operating zone 1 except for community watersheds, which are designated as operating zone 4.

The Deputy Administrator and the MOF submit that any adverse effect caused by pesticide use under the Plan would not be unreasonable given the small area that is likely to be treated, the low toxicity of the pesticides, and the resource and environmental benefits to be gained by establishing a healthy coniferous forest.

The Panel agrees with the Appellant that some of the measures set out in section 6.2.2 of the Plan, for the purpose of protecting grizzly bears, have little practical effect because they prohibit aerial spraying which is not authorized under the Plan, in "areas designated as moderate, or high value grizzly bear habitat as noted in a Land Resource Management Plan," and no such areas have been designated in the Kootenay-Boundary Higher Level Plan Order found at Appendix 1 of the Plan.

The only aspects of section 6.2.2 that might provide some benefit to grizzly bears are the following:

> When not in competition with conifers, direct treatment of Vaccinium, Devils Club, bearberry, currants and other berry producing shrub species and mountain ash shall be avoided.
>
> Moist areas such as areas containing skunk cabbage, horsetail. Carex, lily, cow parsnip, sedges, clover should be avoided or manually treated, as these are preferred forage areas.

However, the Panel is not satisfied that those provisions provide sufficient protection to reduce the risk of an adverse effect on grizzly bears from a loss of food plants to a reasonable level.

The Panel notes that Dr. McLellan's report makes some specific recommendations concerning how to minimize adverse effects on grizzly bears. He states that "each cut block, or even portion of a cutblock should be assessed for bear food production before a decision is made on how the site should be managed." He also states that "If care is taken to not use glyphosate in portions of the cutblocks in this area that have exceptional amounts of bear foods (fruiting shrubs) and to use methods such as "hack and squirt" that do not target these shrubs then treating an average of 7 ha per year should not negatively affect the grizzly bear population in this area."

While the Plan requires DSA's for every site where herbicide treatments are anticipated, and those DSA's must be submitted to the Deputy Administrator, the

Panel finds that, the Plan should be sent back to the Deputy Administrator, or his successor with directions, as recommended in Dr. McLellan's report.

In particular, the Panel orders that the Deputy Administrator or his successor shall amend the Approval to include appropriate conditions that will ensure that:

- each site where herbicide treatments are anticipated shall be assessed for grizzly bear food production; and
- glyphosate shall not be used in portions of the cutblocks that have exceptional amounts of grizzly bear foods, including fruiting shrubs.

The Panel is satisfied that, if the Approval is amended in accordance with those directions, approval of the Plan will not result in an unreasonable adverse effect as alleged by the Appellant.

DECISION

In making this decision, the Panel has carefully considered all the documents, evidence and arguments presented by the parties, whether or not they have been specifically reiterated herein.

For the reasons provided above, the Panel sends that the Approval back to the Deputy Administrator, or his successor, with directions to amend the Approval to include appropriate conditions, as indicated above, to provide further protection for grizzly bears. The Panel upholds the remainder of the Approval.

Accordingly, the appeal is allowed, in part.

Alan Andison, Chair
Environmental Appeal Board

June 1, 2004