THE PERCEPTIONS OF MICHIGAN DEER HUNTERS REGARDING QUALITY DEER MANAGEMENT (QDM) AND RELATED ISSUES

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1 The Problem

As defined by the MDNR, "Quality Deer Management (QDM) is an approach to deer management that requires restrictive buck harvests and sustained antlerless harvests to produce a more balanced sex ratio and populations in balance with available habitat" (MDNR 1999). The Quality Deer Management Association's definition is more holistic:

> QDM is a management philosophy/practice that unites landowners, hunters, and managers in a common goal of producing biologically and socially balanced deer herds within existing environmental, social, and legal constraints. This approach typically involves the protection of young bucks (yearlings and some 2.5 year-olds) combined with an adequate harvest of female deer to maintain a healthy population in balance with existing habitat conditions and landowner desires. This level of deer management involves the production of quality deer (bucks, does, and fawns), quality habitat, quality hunting experiences, and, most importantly, quality hunters (QDMA web page: www.qdma.com.)

Both definitions imply that QDM is more than trophy buck management. However, many of the regulation proposals which have been referred to as "QDM" regulations in Michigan have largely focused on antler restrictions to protect yearling bucks as a means of producing more mature bucks in a deer management unit. Requests for these special restrictions in various areas of Michigan show evidence of increasing, and increasing conflicts among hunters can be expected. This study was undertaken to sort through the perceptions of Michigan hunters to provide a baseline understanding of hunter support for QDM-related restrictions as well as assess their understanding of the range of goals and strategies involved in "quality deer management". However, we took the opportunity to collect additional information about Michigan deer hunters. We think the results will help the agency as it considers deer management policy direction and will provide assistance to field managers working with demands from deer hunter constituents in their region.

In this report, we focus on summarizing some key findings and expanding on their implications for deer management in the state. A wide range of results are described in more detail in the final report to the MDNR Wildlife Division (Bull and Peyton 2001).

2 Overview of Methods

A sample of 10,000 deer license holders was randomly drawn from the 2000 hunting season records. A mail questionnaire, a reminder post card and a second copy of the questionnaire were sent out in spring of 2001. Response rates were unacceptably low, so the questionnaire was shortened and mailed again in June. The final adjusted response rate was 60%, considerably below any we had achieved in the past with less effort. We selected 5 questions to be used in a survey to assess non-response bias and mailed it to a random sample of 200 non-respondents in each of the three regions of the state. Non-respondents were consistent. Only 28% of this group responded to this follow-up survey. In addition to this small non-respondent data

set, we also had some data from the original sample data base (age, residence) that we could use to compare respondents with non-respondents.

In addition to the random sample of hunters, we obtained a membership list of the Michigan Chapter of the QDM Association and sent surveys to the entire list (N = 439). Results from this group were not combined with the random sample, but were used to compare responses. Response rate to the QDMA survey was 82%.

3 Application of Results

It is important to keep the context of this survey clearly in mind. It may be enticing to use these survey results simply as a vote for decision making on some issues. However, survey results should not be construed as a mandatory "public vote" unless the study is designed to be used in this manner. Studies such as this one are designed as diagnostic tools. They describe "what is" regarding public opinion – not necessarily what "ought to be" in public policy. Their contribution is the identification of values, the nature and accuracy of perceptions and other information useful in working with the public and planning the best agency strategies. In contrast to this general survey about QDM attitudes, the special surveys used to evaluate a proposed "QDM" regulation in a particular deer management unit are exceptions. In those cases, although the use of a sample instead of a census does not qualify it as a "vote", the survey is a poll and intended to be used as a basis for deciding policy. The survey recipients are clearly informed of the intended use and both the questionnaire and sampling methods are clearly designed for that purpose.

3.1 Non-response bias considerations

There are potential limitations on our results due to non-response bias. However, our exploration of the non-response bias suggests that no major surprises would be found among those not responding. The trends we have described should hold for the entire sample (and population) of deer hunters, and serve effectively in planning for deer management. Although the proportions of the public who hold various opinions may vary subtly, there is no evidence that reversals or even major differences would have been found if we had achieved a more typical 70 - 80% response rate.

The followup survey sent to a small sample of those who had not responded to our larger survey sheds some light on what biases might exist. Non-response followup usually reveals that those who fail to respond to a mail questionnaire are less interested in the issues. That may be the case here for a segment of the non-respondents. Fewer of them reported deer hunting to be a highly important activity and fewer were members of deer-hunting organizations which is consistent with the usual pattern of non-respondents. However, on the two regulation questions asked of them on the follow-up survey, non-respondents had even stronger (more extreme) opinions than respondents to the main survey. The non-response group appears to be comprised of both the typically less interested non-respondent and a group of very interested recipients who did not respond for some other reason. The important question unanswered is, how many of each group make up the non-respondents and what influence would that have on generalizing our

results to the Michigan hunter population?

One response pattern is very clear – older hunters were more likely to respond than younger ones. Survey recipients in each age group responded at a higher rate than the preceding age group on all questionnaire mailings: version 1, version 2 and the followup surveys. Based on the birth dates provided in the original sample, the average age of the non-respondents was younger than that of the respondents (42 years versus 47 years; $F_{(1, 9182)}= 351.7$; $p < .001$). Several variables were influenced by age, suggesting that some non-response bias might be related to the age differences.

We calculated weights based on the proportion of each age group in the original sample and weighted the responses to determine what the most extreme non-response bias due to age might be. In other words, if we assumed that all non-respondents would have opinions similar to same-aged respondents, how would the results have been changed? We found that the weighting did not change the findings on the five attitudinal dependent variables (support for older age structure among bucks or the four regulations posed as means to achieve older age structures). Therefore, even though non-respondents tended to be younger than respondents, weighting their similar-aged respondent counterparts to represent these non-respondents did not change the proportions who supported or opposed various options.

Another possible consequence of this younger non-respondent group regards issue management. In many studies where non-respondents are found to be less interested in the issues, it can be safely assumed that the most likely participants in emerging issues have been heard from. In this case, the non-respondent follow-up suggests that an unknown proportion of interested recipients – and therefore potential participants in issues – have chosen not to respond to the survey.

3.2 Implications for MDNR and Natural Resource Commission QDM policy

Quality Deer Management and requests for regulation changes which are presented as an application of QDM have been frequent topics at NRC meetings. However, it appears that "QDM" is not particularly salient for the general hunting population. Over a third of our respondents had not heard of QDM prior to our survey. Only a fifth reported knowing someone who claimed to practice QDM on land they owned or leased. Michigan Deer Management Units (DMU) where QDM-related regulations have been established to protect yearling bucks were not recognized by most of the respondents. The largest group of informed respondents were the 75% of the QDMA members who knew of the regulation in DMU 107. As a group, respondents reported they discussed "QDM" very little, although they did discuss QDM-related topics such as protecting spike bucks. The study suggests that issues associated with QDM practices are known to most deer hunters, but QDM is not recognized as a formal, well-defined management approach such as that defined by the QDM Association.

We used QDMA literature and discussions with the Executive Director of the National QDMA to establish the basic goals and strategies of Quality Deer Management with which to measure respondent perceptions. However, although some of these components are addressed in the official QDMA lists of goals and principles, others must be gleaned from working policies and literature of the organization. For example, the use of habitat management is advocated as

one strategy to achieve deer management goals, and a major emphasis is placed on extensive use of artificial food plots to supplement natural habitat. However, when the desired deer population goal cannot be reached any other way, artificial feeding is discussed in QDMA literature as an acceptable means -- except in Michigan where bovine TB exists in wild deer. Similarly, although the organization does not explicitly declare that "trophy buck production" is one of its goals, production of bucks with large antlers is a valued product of QDM, that results from the emphasis on older age structure of bucks and higher buck:doe ratios.

Based on their attitudes and intentions regarding buck and doe harvest, respondents were categorized as "practitioners" if they already supported harvest consistent with QDM. "Unlikely practitioners" opposed most but not all QDM harvest principles. Those whose attitudes opposed protection of younger bucks and the harvest of does were "non-practitioners". (See section 3.3 below for a more detailed discussion.) A strong majority of general hunter practitioners and many of the unlikely and non-practitioners as well as QDMA members were aware that a natural deer herd in balance with habitat and a balanced buck to doe ratio were QDM goals. Far fewer of the general respondents recognized improving deer hunter image as a goal. On the other hand, more QDMA members and fewer general respondents than we expected, identified production of trophy bucks as a goal. Representatives of the Michigan QDMA have stressed that QDM is "not about producing trophy bucks". Yet, in working with deer hunters and groups (e.g., focus groups), we have often heard QDM dismissed as simply a focus on "trophy deer management". The host of "Practical Sportsman" has editorialized about QDM in this context. However, most non-practitioners – those whose behaviors and intentions are opposed to QDM practices – did <u>not</u> select production of trophy bucks as a goal of QDM. Even more surprising was the large proportion of QDMA practitioners who <u>did</u> identify this as a goal of QDM. It appears that a portion of the membership are quite aware of this benefit of QDM, whether or not they understand the holistic philosophy of the QDMA.

Harvest strategies (antlerless harvest, protection of yearling bucks) were most commonly identified as appropriate QDM strategies from the list we presented. Producing food plots and collecting data on the deer herd were recognized, especially by practitioners, but not as commonly as harvest strategies. Many respondents – up to a fourth of practitioners and a surprising number of QDMA members -- identified winter feeding as one of the strategies of QDM. Half of the respondents hunting in the UP and a fourth of the QDMA practitioner members reported they had fed deer to "enhance" deer habitat. Obviously, this is in stark contrast to the policy for Michigan which has been distributed by the QDMA. It provides further evidence that "quality deer management" has not yet become a well defined and standardized movement.

"Quality Deer Management" is not yet functional as a guiding term. Most responding hunters and even many members of the QDM Association do not appear to view QDM as a holistic approach to keep a deer population in balance with its ecological and social carrying capacities. No doubt the NRC will continue to face regulation-specific issues, primarily involving production of more abundant mature bucks, but it is less likely that strong public demands will be heard in the near future to achieve the other population goal elements. Proposals to the NRC for regulation change can be expected to be labeled as QDM which are, in fact, in opposition to it. For example, those proposing to allow winter feeding to "enhance" habitat in the Upper Peninsula may justify their proposal as "quality deer management" .

The MDNR position on QDM has been to support the approach on private lands where demanded by and equitable for stakeholders, but not to advocate the statewide implementation of the program. Some elements of QDM reflect a stewardship ethic that could offer a potential advantage to wildlife management and Michigan citizens if it were widely endorsed by the hunting community. A related movement advocated by the Sand County Foundation in Wisconsin is Quality Hunting Ecology (QHE). The two are similar in some ways such as their emphasis on "natural" buck:doe ratios. However, QHE differs from QDM by placing more emphasis on the ecosystem and both social and ecological impacts of deer management and less on the harvest benefits. The stewardship ethic espoused in the QDMA can be compromised by some strategies accepted by the Association. For example, the use of artificial feeding and extensive agricultural food plots when "traditional habitat improvement practices are either not possible or economically justified" could maintain deer above social or biological carrying capacity and/or create risks of disease transmission.

The potential stewardship benefits offered by QDM and QHE currently are not being realized by wildlife management. If QDM could communicate a holistic philosophy of achieving optimal deer population goals to the state's hunters, it could be instrumental in enhancing the stewardship role of hunters in the state and improve the status of deer management. Currently, QDM issues in Michigan focus piecemeal on the protection of yearling bucks with little dialogue on the larger and even more important goals to be achieved. The QDMA has a considerable challenge to clarify the goals and strategies of the management approach to Michigan hunters, including their own members. The Michigan DNR would also benefit by taking advantage of opportunities to clarify what QDM is and is not. It seems prudent, for example, to avoid using the term QDM when communicating about antler harvest restrictions unless they are an intended piece of a larger and visible program. Given the low recognition of QDM stewardship goals and the considerable confusion about what QDM represents, the MDNR and NRC should use the term very cautiously in relation to their deer management decisions. This would create and protect the QDM concept as a standard and holistic approach, benefitting the QDMA, MDNR and Michigan deer hunters.

3.3 The status of current QDM-related practices and support

The Quality Deer Management Index (QDMI) we created from the data provides a means of describing the range of acceptance and practice of two strategies of QDM: protection of yearling bucks and harvesting does when necessary to achieve lower deer populations and/or more appropriate buck:doe ratios. We categorized respondents as "practitioners" (practiced both kinds of strategies), "potential practitioners" (practiced some but not all), "unlikely practitioners" (practiced very little of either) or "non-practitioners" (expressed intention to not practice one or both). Of course, the absence of voluntary restrictions to protect yearling bucks or encourage the taking of antlerless deer, does not necessarily imply a non-QDM practice. If population sizes are small in a local area, it may not be necessary to harvest does to meet QDM goals. Similarly, a respondent who reports restricting buck harvest to protect yearling bucks may simply be interested in trophy deer goals and not the broader population goals associated with QDM.

The majority of respondents (61%) were practitioners or potential practitioners, and only

3% were non-practitioners. This reflects substantial attitudinal support for QDM-related harvest regulations – even when non-response problems are considered. Statewide, half of the respondents followed only those practices prescribed by law. About a third hunted in a situation which voluntarily encouraged the shooting of does, and from 15 to 19% discouraged it. Voluntary QDM-related harvest practices were more likely among those hunting private land (either exclusively or mixed public and private) and those preferring to hunt with a bow. Although UP hunters were more likely than lower peninsula hunters to indicate that they voluntarily placed some antler restriction on their buck harvest, a smaller percentage of UP hunters encouraged the harvest of antlerless deer.

QDM-related land management practices were most common in the Northern Lower (NL) region, although still limited to less than a fourth of this group. Nearly half of the Southern Lower (SL) hunters compared to a third of UP hunters indicated they had no opportunity to engage in any of the land management or other practices listed. Understandably, two-thirds of those who hunt only public land had no opportunity to perform these practices.

The support revealed above is consistent with respondents' attitudes about antlerless and yearling buck harvests in their area. Major issues have erupted regarding doe harvest in some parts of the state in the past three years. However, surprisingly, nearly half of our respondents disagreed that too many antlerless deer had been harvested in their hunting area. About a fourth of the respondents agreed and 28% were undecided. Hunters in the NL were most in agreement, but still only about a fourth felt too many antlerless deer had been harvested. Nor were there any real differences in attitude between those who hunted public versus private lands. The strong statements made by some interest groups directly to the NRC that antlerless harvests were excessive are apparently without majority support among the hunting community.

About 54% of the respondents agreed that yearling bucks had been over harvested in their area and nearly a third were undecided. Only 16% did not think that too many yearling bucks had been harvested in their area. Slightly more hunters using private or private and public land than those hunting public land only agreed that too many yearling bucks had been harvested. If these opinions show recognition of need, about half of the respondents would be predisposed to support antlerless harvest and yearling buck protection in their hunting area. About a third were undecided in each case and would need to be persuaded of the need for either regulation.

3.4 Support for specific buck harvest regulation options

Regardless of management region, a majority (55%) of our respondents agreed that the agency should manage for an older age structure among bucks in Michigan. Nearly a third were uncertain and 16% disagreed. Much of this uncertainty came from SL hunters. The prevalence of mature bucks in the SL creates a different set of circumstances which appeared to influence our results on many SL responses.

It is one thing to agree in principle with a goal to produce an older age class of bucks, but quite another to agree to the specific strategy for achieving that goal. We posed four regulations that would contribute to older age classes of bucks. As a general pattern, the UP hunters were

consistently more decided and supportive of those regulations and SL hunters were more undecided. This fit the general pattern for those who hunted in the SL region, where deer have increased dramatically in recent years and mature bucks are more prominent.

One option to protect yearling bucks is to place a minimum antler size restriction on all bucks harvested. At the time of the survey, Michigan required that one of two bucks harvested have a minimum of four antler points on at least one side, but the other buck harvested could be any buck with a minimum of 3 inch spike antlers. Respondent's were asked what their position would be if an antler restriction was proposed to protect yearling bucks in their hunting area. Respondents were more decided on this matter than on the goal of older age structures among bucks. Nearly 2/3 of the deer hunters who said deer hunting was their most important recreation supported the idea and about a fourth opposed it (See section 3.5.2 for a detailed description of the "importance" variable.) The principle of antler restrictions appears to have a lot of support in the state that is essentially unrelated to type of land access or age of respondent. The consensus among private, public and private/public land hunters is noteworthy. There is a slight tendency for members of organizations or hunters in the UP to be more supportive than other groups.

We also probed reasons for their support or opposition to the antler restriction idea. Those who supported the regulation (59% of respondents) were primarily interested in "seeing and/or harvesting bucks with large antlers". Encouragingly, an equally important reason had to do with being responsible for the quality of deer in their area. Satisfaction derived from their involvement in managing deer has been claimed as one of the benefits of QDM (Woods et al. 1996). Perhaps opportunities exist to capitalize on this as a means of encouraging stewardship in Michigan's deer management program. Although balancing buck to doe ratios was the third most important reason for this group, the mean suggested this reason was of considerable importance to respondents.

About 24% of respondents were opposed to antler restrictions. Among the reasons we listed for their opposition, the most important to this group was the concern that it would interfere with young hunters' opportunity to shoot a buck. A strong majority was also concerned that their own ability to take a buck would be limited. Over a third of the group indicated they were opposed because they did not care whether they shot a large buck. By inference, the remaining 2/3 of those who oppose antler restrictions do care whether they have an opportunity to shoot a mature buck and may favor a different approach to producing them.

Those who were uncertain about the desirability of these antler restrictions (13%) tended to be unclear about whether the restrictions would work, what the effects would be on them and what the benefits would actually be. All of these would need to be targeted in any informational campaign by an interest group requesting the adoption of antler restrictions for their hunting area. A small majority of this "uncertain" group also were not convinced the benefits of the antler restriction were worth the lost opportunities to shoot smaller bucks. This position would be more difficult to change with information alone because it reflects the value placed on the size of the buck they harvest. However, informing these respondents of other values associated with creating an older age structure in a buck population might broaden the perspective of this group.

The reasons given by the hunters for their support or opposition are interesting, but not compelling. It is always a risk that when respondents are presented with a list such as this, they will check those things as important which support their position, whether or not they functioned

as reasons before the fact. Still, these results give some basis for better understanding the perceptions of hunters who support and oppose antler restrictions. They predict some of the arguments which are likely to play a role in any debate and provide an opportunity to anticipate concerns and information needs so that public input is informed.

Of the four regulations proposed, the one buck rule received the most approval. However, it promises to be a contentious issue. Among those for whom deer hunting was most important, 50% supported and 41% opposed it and among those, strongly supported and strongly opposed were equally represented. These intensely involved (i.e., deer hunting is their most important recreation) and divided deer hunters would be likely to enter into an intense debate with the agency and each other should this be proposed.

The earn-a-buck proposal was least liked (39% supported, 43% opposed). This, too would be highly contentious with the most highly involved hunters polarized on the question (41% supported versus 45% opposed).

Although more respondents supported the use of a buck tag for a button buck (54% vs 28% opposed), and a majority of those who supported this option strongly supported it, two-thirds of those opposed were strongly opposed.

As a group, hunters preferring the bow were more supportive of antler restrictions than firearm-oriented hunters. However, they discriminated regarding the specific restrictions they would support. Firearm hunters were substantially more supportive of a one buck rule than those who prefer the bow – creating definite potential for conflict between the two groups over the allocation of buck harvest. Most of those who prefer a bow also hunt during firearm season and a one-buck rule would deprive them of hunting opportunity. Firearm hunters, on the other hand, may see this as an opportunity to re-allocate many archery bucks to firearm season. For the other two restrictions, bow hunters were more supportive than firearm hunters.

We also found some relationships with membership. Those who were members of deer hunting-related organizations were more likely to support the idea of antler restrictions, the earn-a-buck regulation and use of buck tags for antlerless deer. However, although slightly more members favored the earn-a-buck rule, members were highly polarized on this issue and considerable conflict would be likely within and between organizations.

Although considerable support was expressed in the statewide sample for a one-buck rule and use of buck tag for a button buck, they are both volatile issues among different age groups. Some very strong positions exist on both sides. Younger hunters (< 44) were more likely to agree the DNR should manage for an older age structure than were older hunters. Antler restrictions also had more support from younger respondents. These differences were even more pronounced for the extreme age groups (<34 versus >54). A one-buck rule had more support from older respondents than younger hunters. A plurality of both age groups opposed an earn-a-buck rule, but younger hunters supported this option in larger numbers than did older hunters.

3.5 Implications for future issues associated with QDM-related management

The state of understanding of quality deer management promises to confound regulation issues. The concept apparently is not defined and accepted as a standard approach to management either by the general deer hunting community or the members of the QDMA. Misuse of the QDM

concept to justify fragmented proposals (e.g., to protect yearling bucks or re-allocate buck harvest opportunity) will lend confusion to the QDM issues and make it more difficult to focus on the real issue components that need to be addressed.

Many groups of respondents assigned weak use and credibility to the DNR publications and personnel. This will continue to hamper the agency in its efforts to inform stakeholders and manage issues.

A majority of respondents agreed that the agency should manage for the goal of creating an older age structure among bucks. There was even more agreement that some antler restriction is desirable to achieve that goal. However, respondents were varied in their positions on the other three regulations and substantial numbers expressed extreme positions (strongly support or oppose). Of the three, an earn-a-buck rule would be most contentious and would require the strongest preparation to gain acceptance. However, our findings also suggest that neither a one-buck rule nor a policy to use buck tags for buck fawns would be achieved without major disruption.

Input during buck harvest regulation discussions – as with any issue – will likely not be representative of a cross section of the state's deer hunters. Our findings predict more participation from younger hunters who prefer bow-hunting, for example. More detail is reviewed in the following subsections regarding issue participation based on hunting method preference, the importance of deer hunting and the age of the deer hunter.

3.5.1 Hunting method preference

The strong relationships found between hunting method preferred and attitudes about deer management have implications for deer management issues today and for some time in the future. A strong pattern of differences were found between those who prefer to hunt with a firearm and those who prefer to hunt with a bow (or prefer bow and firearm equally)[1]. Archery hunters comprised about 16% of the respondents, 34% were bow/firearm hunters and 50% were firearm hunters. As a group, archery hunters were younger (Figure1) , placed more importance on deer hunting and were more likely to be members of organizations than firearm hunters. On average, they deer hunted nearly three times as many days in 2000 than firearm hunters and averaged only one day less during firearm season than firearm hunters. Archery hunters were more successful at harvesting both does and bucks than firearm hunters. This combination of characteristics describes a stakeholder group that is very likely going to initiate and be involved in deer management issues and such has been the experience in Michigan. The bow/firearm group was between the other two on most characteristics, but often were more similar to bow hunters than firearm hunters as a group. The bow/firearm group would reinforce the position of the archery hunters on many issues. Bow hunters are no longer a minority.

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[1]Although these are preferences and an individual in either group may hunt with the other method, we term them "archery (or bow) hunters", "firearm hunters" and "bow/firearm hunters" here. In most analyses, mixed preference hunters (bow/firearm) were between archery and firearm hunters in their choices and attitudes.

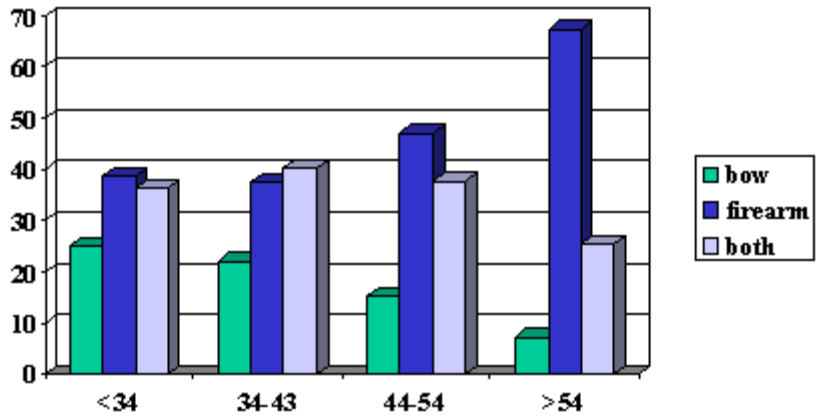

Figure 1. Preferred deer hunting method by age category

The distinct tendency for archery hunters to be younger also suggests that the makeup of deer hunters in the state may shift. Duda and Southwick (2000) have proposed that bow hunting offers an enticing mechanism for recruitment into hunting and shows that bow hunter satisfaction levels are higher and dropout rates are lower than for other methods of hunting. Those indicators of intensity are supported by this study. Among the many implications of such trends is the likelihood that archery hunters will continue to provide input to policies and will play an increasing role in deer management issues.

Archery hunters were far more likely to be either QDM practitioners or potential practitioners than were firearm hunters. Archery hunters – as well as the other two groups – also strongly supported the goal to produce more abundant mature bucks. This proclivity towards QDM-related practices and regulations is supported by archery hunter responses to most attitude questions with the exception of the one-buck rule. A one-buck rule would be favored by a substantial portion of the firearm hunters but only a slim majority of archers. A substantial portion of archery hunters would oppose this rule. This proposal would create considerable conflict in Michigan.

The earn-a-buck rule would be equally contentious among – and within – method groups. This option had less support overall among respondents but was more supported by archery hunters than the one-buck rule. In addition to low support overall, considerable polarization existed even within each of the three methods groups, creating more potential for issue activity.

3.5.2 Importance of deer hunting

The importance placed on a recreational activity by a respondent has served well in studies to describe the level of specialization, commitment and intensity of their participation in that activity. The extent of disagreement among the most intense hunters – those who report that deer hunting is their most important recreational activity – also serves as a useful predictor of issue activity and level of public involvement. This group of highly involved hunters are the ones most likely to be involved in management decision processes, especially if they disagree with the

proposed policy. About a fourth of the respondents reported they were in this category. When non-response bias is considered, the proportion of the entire Michigan deer hunter population contained in this category could be smaller. Still, the group is significant. Even if this group actually comprises only 10% rather than 25% of the state's deer hunter community, 70,000 citizens who value deer hunting above all other forms of recreation are likely to express their views and will comprise a substantial force. In addition, many of those for whom deer hunting is more important than most other recreational activities – the second most intense group of hunters – will also be motivated to participate in some issues. Their interest in the sport should not be underestimated. They would increase considerably the potential pool of intensely motivated and involved citizens. Considering that the group of hunters for whom deer hunting is less important than most of their recreational activities will be less likely to express their views in regulation issues, the opinions held by the first two groups of more intense hunters are even more consequential.

For several of the options presented in the questionnaire, the most intense hunters often had large groups in both the strongly support and strongly oppose categories. An antler restriction to protect yearling bucks was supported by a strong majority of the most intense hunters, but it was also opposed by 24% of that group. Indeed, when the two most intense groups of deer hunters were combined, a third of them were opposed to the antler restriction rule. These most intense hunters were split similarly on a one-buck rule. The earn-a-buck rule was strongly opposed by a third of the most intense hunters and strongly supported by a fifth of that group. As a group, these intense hunters were strongly polarized on this earn-a-buck question with about 44% supporting and 45% opposing it. Using a buck tag for a button buck seems to be only slightly less contentious than the preceding two regulation options. A slim majority of intense hunters would support it (45% "strongly support"), but over a third would oppose it, and a fifth would "strongly oppose" the proposal.

3.5.3 Age of hunters

Any issues should have active participation from younger hunters. There was a tendency for younger respondents to be more intense than older respondents about deer hunting. They more likely preferred bow-hunting and were less likely to be members of organizations. Young respondents were more interested in mature bucks and more likely report they would move their hunting area to have access to them. Larger portion of young as opposed to old respondents were strongly opposed to a one buck rule, and strongly in support of earn-a-buck, although these portions were small.

Non-practitioners were older and reported more hunting experience. The non-practitioners comprised a very small portion of respondents, but they reported deer hunting was as important to them as did practitioners. They are going to be impacted by special regulations and are likely to become actively engaged in opposing such proposals.

3.5.4 QDMA membership

Our results (presented in the final report to the MDNR Wildlife Division) show that the

QDMA members are not representative of the hunters of Michigan regarding their attitudes, hunting preferences or other characteristics. Within the QDMA membership, there appears to be a broad range of understanding regarding goals and the desirability of strategies such as supplemental feeding in Michigan. Although the QDMA membership will likely lead efforts to change harvest regulations, the NRC evaluation of those changes must be considered in the context of the full range of stakeholder views in Michigan.

3.5.5 Residency status of hunters (local versus non-local)

Based on an earlier survey (Minnis, 1996) that revealed differences in attitudes regarding crop damage among hunters who resided within and outside counties, we expected to find similar differences in this survey. There were some differences in the type of land hunted. Non-local UP hunters were twice as likely to hunt public land as locals. They were understandably less likely to purchase antlerless permits than local hunters. Some other minor differences existed regarding hunting effort, use of bow, etc. However, no differences were found in attitudes regarding the special regulations we posed. The only exception was that slightly more locals than non-locals in the UP supported the earn-a-buck regulation (41% versus 34%). It appears from these results that residence status (local or non-local) of hunters will have little influence on perceptions regarding the issues presented by this survey.

3.6 Evaluation of the QDM approval procedure currently adopted by the NRC

A QDM task force was formed to recommend to the Natural Resource Commission, a process for evaluating proposed QDM-related antler restrictions in a DMU. Included with the recommendation to survey hunters in the area was the suggestion that key questions present an "I don't care" as well as "undecided" response option. This would allow "don't care" responses to be dropped when calculating the approval rate among respondents. In this study, we found that 4% did not care and 13% were undecided about antler restrictions to protect yearling bucks. Although, there might have been a larger proportion of "don't care" responses if closer to100% had responded to the survey, even a 4% proportion makes the measure important. It provides a fair basis for determining approval and reduces the number of respondents who must approve the proposal to achieve the 66% approval rate recommended by the task force. It is recommended that this distinction be continued in future surveys.

Another contentious aspect of the QDM procedure has been the requirement that the mail survey achieve a 66% approval (excluding those who mark "I don't care") for the proposed regulation change. We asked respondents what percent of hunters should approve a proposed antler restriction change before it was put in place. Statewide, the respondents recommended an average 61% approval rate. The average ranged from 60% in the SL to 62% in the UP. Almost 60% of the respondents believed approval should be set at 60% or higher. When adjusted for the "I don't care" responses (at least 4%), the average reported by our respondents is in line with the 66% approval required.

3.7 Indicators of future changes

The differences among various age groups were sometimes large and pose questions regarding future changes in deer management. For example, respondents appeared to be somewhat stratified regarding where they most commonly hunted. There was a subtle tendency for younger hunters to more commonly hunt in southern Michigan and a slight tendency for more of the older groups to hunt in the NL. The regional difference was most pronounced in the UP where 38% of those who most commonly hunted there were 43 or less and 62% were over 43 years of age. All of the tendencies were stronger when four separate age groups rather than two were considered. Younger hunters also differed from older cohorts on many of the attitudes and other variables. For example, younger hunters were more likely to prefer a bow than were older respondents.

A number of speculations could be made regarding the causes and implications of these age differences. However, the key question is whether these reflect temporary "life stage" differences or substantive differences among cohorts. If these are life stage phenomena, it can be expected that young hunters will eventually resemble older cohorts of today as they grow older and replace them. If younger cohorts are different in substantive ways, that will be reflected in their choices throughout their hunting career; i.e., as older hunters they will be different than the older hunters of today. This would predict changing demands and patterns among deer hunters in the future. For example, as the current young cohort replaces the older cohorts, the deer hunting traditions and use of the northern areas might shift substantially.

Today we have a nearly equal split between those who prefer the firearm and those who prefer the bow at least as much, if not more than the firearm. Even those preferring both methods equally often resembled bow hunters more than firearm hunters in much of the analyses. If archery is a more effective recruiting mechanism as suggested by Duda and Southwick (2000), are we observing the progressive stages of a shift towards a more archery-dominated deer management program? It is beyond the scope of this study to probe these possibilities in detail, but perhaps the data offer some opportunity for managers to reflect on opportunities and threats represented by potential change.

The strong differences between those who preferred a firearm and those who preferred a bow or both bear some thought. The differences we found between these groups regarding their attitudes, deer hunting importance, hunting effort, age, membership, etc. makes this an important means of segmenting Michigan deer hunters. The agency no longer can identify archery and firearm deer hunters based on license buying behavior. This is a loss in that the segments can not be easily identified and monitored through license type. On the other hand, we found stronger differences based on their preferences for bow or firearm than were revealed by their self reported history of use of these methods. Given the potential for future deer issues along these lines, the agency would benefit by developing a standard means of identifying these preferences on harvest surveys, or other input gathered from the hunting public on various deer issues.

3.8 Implications for communication needs and strategies

3.8.1 Communication targets: messages and audiences

The MDNR supports the voluntary implementation of QDM on private land (MDNR 1999) but there is no official plan to implement QDM as a statewide policy. A set of procedures does exist to evaluate requests from groups of hunters who would like to have antler restrictions in their hunting area as a means of protecting yearling bucks and shifting the age structure of the buck herd. Our findings reveal strong support for this type of management, but it is not a consensus. The situation has potential to create many issues in the near future. Communication could undoubtedly be a useful tool to address those issues and our findings provide some implications for communication efforts. In addition, private interest groups trying to build support for special antler restrictions in their area – and others in opposition to those proposals – may benefit from considering some of these implications.

Although protecting yearling bucks is not in and of itself "Quality Deer Management" it is one of the strategies and proposed antler restrictions are often couched in terms of QDM. Elsewhere in this discussion section and other sections of the report we have identified many uncertainties and misconceptions about what QDM's strategies and goals are. Clarification of the movement known as QDM should be an immediate goal of communication to develop a better informed public. Without it, there will certainly be increasing confusion and perhaps more polarization as future proposals and demands are made. Commensurate with this is a major need to develop a standard definition of QDM and to apply it carefully in dialogue emerging around regulation changes. For example, communication efforts should not use the term QDM to describe single dimension antler restriction proposals unless the proposal is explicitly tied to a more comprehensive deer management program which meets the definition.

A communication program regarding QDM-related proposals could take a broad, generic approach and target messages statewide. For example, nearly two thirds of the respondents were not aware that a goal of a comprehensive QDM program is to improve public image of hunters and nearly one third failed to identify "a natural deer herd in balance with its habitat" as a goal. These perceptions did not differ dramatically by preferred method, age or region, although older ages, firearm preference and hunters in the UP were slightly less informed about most of the goals. Targeting the comprehensive nature of Quality Deer Program goals would be appropriate for any region and most segments of hunters.

There is also some advantage to looking at different segments of hunters when considering communication needs. Over 70% of the respondents knew about doe harvest and yearling buck protection as strategies of QDM, but 41% were not aware that QDM involved food plots and habitat improvement. More than a third did not know that collecting data on deer harvest and biology was a QDM strategy. In the latter cases, some stronger differences were revealed among segments. Hunters over 55 years old were much less likely to be correctly informed about those strategies. Hunters who preferred firearms, and those who hunted in the UP were also less likely to be informed, although the differences in these cases were smaller.

The segmentation analysis illustrated above provides some indication of where, as well as which messages should be targeted by communication efforts. Deer hunters segments not only

suggest where the messages should be directed, but also enables communicators to consider how those messages should be designed and delivered. To illustrate, the "landowner" category can be a useful segment because landowners can readily be identified and targeted for communication through tax roles and addresses. Several hunter-landowner opinions regarding selected deer issues predispose them towards support of QDM. For example, a majority believed the buck to doe ratio was too low, there were too few mature bucks for harvest, and there were too many yearling bucks harvested. Further, only a fourth of landowners thought there were too many does harvested in their area. A group interested in building support for antler restrictions or a more comprehensive QDM program in an area could build on several of these opinions in designing a persuasive message.

In some instances, QDM would likely result in a smaller deer herd and a lower success rate among deer hunters. Certainly, fewer hunters would harvest bucks during the early phases of antler restrictions. Over a third of landowners, half the UP respondents and half of those hunting only public land thought that the hunter success rate was already too low for the area they hunt. Hunters and landowners should be informed of the harvest regime dynamics before being asked to support antler restriction changes in their areas.

One major misconception relating to QDM strategies was supplemental feeding. Over a fourth of the respondents believed winter feeding to supplement habitat was a strategy of QDM. Although it is endorsed by QDMA generally, it is specifically excluded in Michigan by the Association because of the presence of bovine TB. It is troublesome that the Association endorses artificial feeding because of the potential for problems in other states. However, it is also problematic that 1 in 4 of our respondents believed this was a QDM strategy in Michigan and that 30% of the QDMA members reported feeding deer as QDM strategy. In this case, slightly fewer hunters who preferred a firearm identified this as a strategy than those preferring the bow or bow/firearm. There were no substantial differences among region hunted and age segments. There is a need to inform hunters – including QDMA members – that supplemental feeding is not an acceptable strategy in Michigan.

For groups working to gain approval of an antler restriction in their hunting area, it would be useful to understand the reasons given for support, opposition and uncertainty regarding such a proposal. The most productive group to convince would be those who are uncertain about the proposed change. Over a tenth of our respondents were uncertain about whether they would support an antler restriction. The majority of the undecided (58%) were firearm hunters with only 10% of archers being undecided. Private land hunters made up 61% of the undecided, with the remaining 39% evenly split between public and private/public land hunters. Of those who were uncertain, 70% indicated they were not clear regarding the benefits, and 63% were not fully sure how the restrictions would affect them.

The greatest reason for uncertainty for an antler restriction was 'I'm not convinced the restriction would work in my area'. Demonstrations of the results of antler restrictions would be effective in addressing this aspect. With the exception of QDMA members, very few of our respondents were aware of the antler restrictions in place on South Fox Island, Drummond Island or DMU 107, suggesting that these demonstration areas should be given more visibility among the state's hunters. When they are available, communicating objective and valid evaluations of special regulations in these areas would enable hunters to reach informed opinions about similar

proposals for their areas.

It must be recognized that one dimension of attitude about antler restrictions involves a hunter's own values. Almost a fourth of the respondents would be opposed to an antler restriction for their hunting area and of these, 38% indicated they don't care whether they shoot a mature buck. There is little that one can do to shift value preferences of others, other than to show benefits to other value preferences held by the individual. For example, one who doesn't care about shooting large bucks, but does care about having a deer herd maintained within carrying capacity may be convinced if a different value is emphasized. Similarly, if hunters see no need for a restriction because – according to their needs -- there are already sufficient numbers of mature bucks in the area , trying to convince them differently will be unproductive (51% of those opposing antler restrictions gave this as one of their reasons). Other values of the antler restriction would have to be emphasized. However, some of the reasons for opposing the restriction might be targeted such as concern for impact on young hunters. The antler restriction might be designed in such a way as to accommodate younger hunters and then this could be communicated in the persuasive materials.

3.8.2 Use of information sources

QDM issues will undoubtedly be addressed more frequently in mainstream media in coming years. Based on their reported use of television, many hunters who are currently unfamiliar with QDM will likely have their first exposure to the term from outdoor TV programs. While the possibility exists for these first impressions to be consistent with accurate QDM goals and strategies, the contrary is also possible. Those with an interest in QDM should consider opportunities to provide information to television producers that will assist them in delivering well-informed and accurate messages that convey the full range of goals and strategies.

While not all organizations embrace QDM, (e.g. Michigan White-tails Forever) the fact that organizations were rated second in credibility by members of organizations indicates that organizations are potentially effective ways to disseminate information on QDM. However, organizations had a relatively limited amount of use as information sources even by members. Further, the 'source effectiveness' of organizations was rated lower than television, other hunters, magazines and newspapers. The use of organizations as a source of information should be approached with some caution in selecting the organization and messages. Communication efforts directed through organizations may have the benefit of high credibility, but still be of limited use, even by the members of the organizations.

The Internet is a small but growing communication medium. Younger hunters and hunters in the SL were more likely to use this as a source of information than older hunters or hunters in the NL or UP. Although the Internet was the second most popular source used by respondents for deer hunting information, only 13% of respondents indicated it was the first place they would seek information. Almost half would first seek information from the MDNR. Opportunity may exist to combine these sources and encourage wider use of the MDNR web page for information. A more complete market and use study would be necessary to assess the potential and/or to find specific ways to accomplish this.

The most important communication network appears to be interpersonal communication

among hunters, ranking highest in use by respondents. An example of this network at work was identified in our survey. Respondents who knew someone practicing QDM were more likely to indicate that producing a natural deer herd and balancing the buck to doe ratio were goals of QDM.

A high percentage of respondents indicated that the DNR would be the source they would first approach if they had a question about deer hunting. Respondents who were non-members indicated that DNR staff were the third most credible source of information (fifth for members). With the large number of hunters unfamiliar with QDM the possibility exists for many related inquiries to be directed to the Wildlife Division. It will be important, therefore, that all Division employees share a clear understanding of QDM (i.e., its goals and strategies) and agree that it is not simply an interest in antler restrictions or trophy management.

Despite the high percentage of respondents indicating DNR staff as their first source for information, there were differences between management regions (54% of UP hunters, 52% NL hunters and 44% of SL hunters). The credibility of DNR employees seemed to be inversely related to use. The UP hunters, with the most use, rated the agency with the lowest mean credibility (less than 'somewhat credible'; fifth in overall credibility), while the SL hunters gave DNR employees a mean credibility of greater than 'somewhat credible' (second in overall credibility). DNR staff were seen as more credible than DNR publications. It is likely that a media campaign of posters or web pages will not be as effective as face to face communication between employees and the public.

A majority of both members (68%) and non-members (51%) indicated either 'a lot of' or 'some' interest in attending a seminar on deer management. Although attempts to organize deer management workshops recently have not been encouraging, this was a surprisingly positive expression of interest. It is likely that "the devil is in the details" and attendance would be conditional on the nature of topics, timing, location, etc. The Pennsylvania Department of Conservation and Natural Resources has been holding meetings such as this with its deer hunting public (Frye 2001). Perhaps an evaluation of that approach would provide some basis for considering whether an investment in MDNR resources would be appropriate here.

Although the *credibility rankings* of information sources across regions were nearly the same (except for outdoor organizations which were higher than DNR publications and web pages in the UP), the different sources were not *used* at the same rate by hunters in all regions. Use of all sources ranged from only "sometimes" to "seldom" for most of the respondents; however, 'Outdoor magazines', 'DNR publications and web pages' were used more by SL hunters, while 'hunting organizations' and 'DNR personnel' were more likely to be used in the UP.

Most of the SL and UP management region hunters were local, while the NL had a much larger proportion of non-local hunters. Although it would be important to design communication efforts to reach non-local hunters of all regions, it is especially problematic when regulation changes are proposed for the NL. For example, meetings concerning antler restriction issues in the NL should be held in strategic locations outside the NL to inform a large percentage of those hunting the NL. Additionally, the media (TV or papers) could be used to provide accurate information to non-local hunters.

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