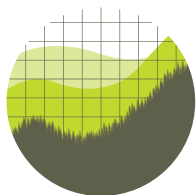# Regulatory Report

NOAA's Enforcement Practices

Institute *for* Policy Integrity

new york university school of law

December 2010

Executive Summary

In 2010, the Department of Commerce's Office of Inspector General uncovered a "troubling pattern" of regionally inconsistent enforcement of the nation's laws on fishing and the protection of marine life. In particular, the Northeast Region of the country appeared to use "excessive" fines to coerce alleged violators into settlements: for example, initially assessing $5.5 million in total fines (an amount more than two-and-a-half times greater than those assessed in the second highest region), but eventually settling for $1.6 million (a nearly seventy percent reduction).[1]

Such inconsistencies created a perception that the National Oceanic and Atmospheric Administration's ("NOAA") law enforcement practices were arbitrary and biased against certain fishermen.[2]

Political pressure began to mount for NOAA to reform its approach: Maine Senator Olympia Snowe accused NOAA of a "systematic mismanagement of law enforcement operations," which had "adversely affected NOAA's ability to regulate fisheries by driving a wedge between regulators and industry members."[3]

As part of a wider reform effort, NOAA recently proposed revisions to its penalty assignment scheme, in an attempt to limit the discretion of individual enforcement attorneys and create fairer, more consistent penalties. However, the current proposal is unlikely to optimally deter violations of the nation's fisheries laws, because the scheme focuses too much on assigning blame to individual violators.

Civil penalties are not the same as criminal penalties: instead of meting out retributive justice for wrongful acts, civil penalties should be calibrated to provide the correct incentives to maximize social net benefits.

Based on analysis of NOAA's proposed guidelines, this Policy Integrity Regulatory Report makes the following recommendations:

- To achieve optimal deterrence, NOAA must move away from the culpability-based model, and instead refocus its penalty calculations on probability of detection and expected harm.

- Intent should have secondary importance to help tailor sanctions to accord with fairness considerations for the regulated community.

- To further address fairness concerns, where large fines would be grossly disproportionate to the harm, NOAA should pursue more aggressive enforcement, rather than large penalties, to provide proper incentives to comply with the law.

- NOAA should rethink its "economic benefit" factor, reserve the imposition of permit sanctions to more narrow circumstances, and improve incentives for self-reporting.

Introduction

On October 18, 2010, the National Oceanic and Atmospheric Administration ("NOAA") published a new Draft Policy for the Assessment of Civil Administrative Penalties and Permit Sanctions ("Draft Policy") implementing a revised penalty scheme for violations of the statutes and regulations enforced by the National Marine Fisheries Service ("NMFS"). NOAA proposes a national policy for determining penalties and sanctions that will provide increased guidance to enforcement attorneys in the Office of General Counsel for Enforcement and Litigation ("GCEL").[4] This Draft Policy is part of a wider reform effort undertaken by NOAA in response to a series of reports by the Inspector General for the U.S. Department of Commerce, which criticized NOAA's previous penalty scheme for enabling inconsistent enforcement among regions and delegating too much discretion to individual enforcement attorneys.

To address these concerns, NOAA proposes a nationally consistent penalty calculation system under which fines are assessed primarily by reference to a penalty matrix reflecting the level of harm done by a particular violation and the level of culpability of the violator.[5] These base penalties can be adjusted up or down based on several aggravating or mitigating factors such as: the violator's history of non-compliance, status as a recreational fisherman, level of cooperation, economic benefit received, and ability to pay.

The current proposal, contrary to economic theory, places too much significance on culpability while paying too little attention to the probability of detection for a given violation. Part I of this report summarizes the central tenets of economic deterrence theory. Part II explores the indirect ways in which culpability might influence the calculation of an optimal fine for deterrence purposes. Finally, Part III suggests ways in which NOAA can alter its Draft Policy to better align with the deterrence model, without entirely sacrificing consideration of fault. These suggestions include: replacing the culpability axis of the base penalty matrix with a probability of detection axis, making more strategic use of permit suspension and seizure powers, and, in some cases, supplementing penalties with alternative means of encouraging compliance such as educational outreach.

Economic Theory Provides a Framework for Calculating Optimal Fines

Under the classical economic theory of deterrence, the optimal fine level for a given infraction can be determined based on the harm done to society by a criminal act, the cost of enforcement, and the probability of conviction for the person committing the criminal act.[6] This framework is rooted in the notion that most people enter into an analysis of costs and benefits when deciding whether to violate the law. A potential violator will "commit a harmful act if his benefit is greater than or equal to the expected fine."[7] In the fishing context the expected benefit is the additional income that can be earned from violating the regulation.[8] The expected fine is expressed as the probability of detection multiplied by the actual penalty.[9]

One central conclusion stemming from the economic theory is that deterrence can be used to reduce the harm to society resulting from violations of the law.[10] Greater deterrence is achieved by either increasing the fine or increasing the probability of detection.[11] Increasing the probability of detection, however, leads to the undesirable result of higher enforcement costs. Therefore, the economic approach encourages the reduction of enforcement costs by lowering the probability of detection and correspondingly increasing the fine for those who are convicted.[12] Other characteristics of the offender, such as income level, are considered irrelevant in determining the fine.[13]

These insights have been further defined in mathematical terms in the work of contemporary economists. The basic mathematical model developed to determine optimal fines is expressed as

$$f^*(h) = h/p + k$$

in which f^* represents the optimal fine, h represents the harm, p represents the probability of detection, and k represents the variable cost of imposing the fine on a particular offender.[14]

Under this model, the theoretically optimal approach to deterring violations of fisheries law would be for NOAA to employ the maximum available fine in every case. For instance, if $f^*(h)$ is set to equal the statutory maximum ($100,000 for the Magnuson-Stevens Act[15]) the optimal probability of detection can be calculated by plugging in estimates of the harm wrought by a particular violation and the cost of imposing the fine. The result will be the lowest probability of detection that can adequately achieve deterrence. As will be discussed below, fairness concerns, statutory requirements, and limited enforcement resources may justify imposing a less-than-theoretically-optimal fine for many violations, but NOAA's penalty scheme should nevertheless be designed with fundamental deterrence principles in mind.[16]

Culpability Is Relevant But Not Central to Determining an Optimal Sanction

The classical deterrence theory described above assumes that sanctions are based on strict liability—the violator's level of culpability has no direct relevance to the penalty equation. In reality, of course, fault-based tiering of penalties is a basic component of many law enforcement schemes. This focus on intent is typically justified by reference to a theory of retributive justice, which requires that "the magnitude of punishment . . . be equal in some sense to the wrongfulness of the act."[17] Retribution seems less appropriate in the context of civil penalties, which are generally designed not as tools of condemnation but as utilitarian means of influencing externality-generating behavior.[18]

From a pragmatic perspective, a culpability-based scheme is also more difficult to implement than a strict liability scheme, as it requires regulators to have a great deal more information, both when setting standards of behavior (what constitutes a negligent violation of catch limits?) and when determining whether a particular actor violated those standards (what precautions did the ship take on the day the catch limits were exceeded?). Under strict liability, on the other hand, "the authority need only measure harm."[19]

While it should not be made the *primary* focus of a penalty scheme, culpability can nevertheless hold some relevance when setting optimal fines under a deterrence model.[20]

Greater Culpability Might Indicate Greater Harm or Lesser Probability of Detection

First, a party's intent may directly affect the values of the model's two core variables: harm and probability of detection. When estimating the expected harm of an act, for instance, intent is "positively related to the probability of harm, for by definition, where a party intends to do harm, his act raises the probability of harm."[21] Similarly, intent "may be correlated with the likely magnitude of harm because a party who desires a harmful result is prone to do greater harm than one who does not."[22] Finally, intent might also indicate a lower probability of detection, because "a party who intends to commit a harmful act is more likely to choose a particular place and time to avoid identification and arrest, or to take steps thereafter to do so."[23] Thus, even from a non-retributive perspective, higher sanctions might be justified for intentional acts.

Culpability Might Affect the Perceived Fairness of a Sanction

Culpability might also have more indirect impacts on optimal penalty amounts. For instance, one might assume (1) that individuals perceive severe punishment for unintentional acts as unfair, and (2) that individuals derive utility from seeing offenders fairly punished and/or disutility from seeing them unfairly punished. The optimal sanction for certain acts, then, would be lower than the classic deterrence model would suggest, because "the full harm caused by a harmful act includes the expected . . . disutility associated with the imposition of sanctions on the violator."[24] In other words, an enforcer should price society's displeasure at seeing the sanction imposed into the sanction itself.

For related reasons, perceptions of unfairness might reduce the probability of detection by encouraging an increase in the rate of noncompliance. Studies suggest that, while instrumental (economic) factors are the primary driver of compliance with fisheries law, normative influences, including the "legitimacy of the management regime and fairness of the outcomes," also play a role.[25] If regulated parties do not feel that penalties are equitably distributed, they may be less likely to comply.[26] Further, even those who remain compliant themselves might nevertheless

become less likely to cooperate with NOAA in the investigation and prosecution of others. Even the most committed adherents of the deterrence model acknowledge that the general attitude towards a regulatory body is important, because "private parties often play an important role in public enforcement by supplying information to enforcement authorities, testifying in court, and so on."[27]

NOAA Should Restructure Its Penalty Scheme with Deterrence Theory In Mind

NOAA can take a number of steps to bring its draft penalty policy more in line with basic deterrence principles. These range from fundamental alterations to the base penalty matrix to smaller changes to the "adjustment factors" it uses to modify base penalties.

The Base Penalty Matrix Should Place More Focus on Probability of Detection

As shown in the research cited above, culpability can be used as a proxy both for the magnitude of the expected harm and the probability of detection when calculating fines. Culpability-based fines might also appear more fair and legitimate to the regulated community. However, the indirect relevance of culpability does not necessitate making it a central focus of the NOAA penalty scheme. Nor do the major fisheries statutes require such a result: some demand only that the Secretary "take into account" fault when assessing penalties,[28] while others do not mention culpability at all.[29]

As such, the Draft Policy should be revised to use probability of detection in place of the culpability axis on the base penalty matrix. Violations with lower probabilities of detection should receive higher base penalties. A finding of an intentional violation by a particular actor could then be used as an aggravating factor that results in an increased penalty, applying the method described for prior violations.[30]

NOAA will likely be unable to precisely pinpoint the absolute probabilities of detection associated with various violations. However, the agency likely has a sense of the *relative* probabilities of detection for various infractions. For example, violations capable of observation via satellite technology are likely detected at a much higher rate than violations that can only be detected by on-ship personnel. Even a rough grouping of violations into three or four categories would provide important guidance in tailoring fine levels.

Furthermore, the relevant statistic is not the *actual* probability of detection but the probability of detection *perceived by the regulated community*. The potential violators, after all, are the ones deciding whether to act, weighing expected personal gain against expected sanction. The classical deterrence formula employs the true probability of detection because it assumes that the community "accurately observes[s] the enforcement probability set by the government."[31] More recent scholarship, however, has emphasized that "it is implausible that individuals' probability estimates are generally accurate, particularly when the probability is extremely low."[32] As such, the rate of compliance will be influenced by individual perceptions of the enforcement rate.

In some circumstances, errors in perception might work in the government's favor. If potential violators *over*estimate the probability of detection, NOAA could achieve optimal deterrence with a lower penalty and lower enforcement expenditures than would otherwise be required. But violators might just as easily *under*estimate the probability of detection, requiring NOAA to spend more on enforcement than would be necessary if violators had accurate information.[33] The most straightforward way to determine how fishermen perceive the probabilities, of course, is to ask

the fishermen what they perceive the probabilities to be. Several survey-based studies of this type have already been conducted by both government and nonprofit groups and could serve as a basis for future research.[34]

Finally, since perceived probabilities of detection are likely to change over time—even in the absence of a major shift in enforcement practices—the agency should ideally attempt to periodically collect new survey data to keep its penalty matrices effective. However, as stated above, in the absence of complete or up-to-date information, even rough estimates of probability would lead to more optimally calibrated fines than the current proposal.

NOAA Should Be More Explicit About How It Ranks Levels of Harm

In addition to evaluating the probabilities of detection for each violation, NOAA should clarify the method used to calculate the level of harm for the violations listed in the schedule. How exactly does the agency distinguish Category I violations from Category IV violations? While the Draft Policy provides a list of several factors to be considered in determining the level of harm for violations that are *not* included in the schedule,[35] it is not clear how much weight is given to each factor and what particular types of harm or negative effects are considered most significant.

Furthermore, it is not clear whether the suggested fines associated with different harm levels were simply based on past agency practice or, preferably, resulted from efforts to quantify the harm posed by violations. To monetize expected harms, NOAA must first assess the degree to which a particular type of violation impairs the sustainability of the fishery at issue, and then quantify the cost of that impairment for society at large. Even if NOAA cannot accurately estimate the full environmental damages (such as ecosystem services), this calculation at least can begin by approximating the known costs. If, for instance, exceeding a catch limit by 10% today correlates with a .01% reduction in the net present value of a fishery with a total quantified value of $200 million, the social cost of the violation would be (at least) $20,000.[36] Such calculations inevitably involve some degree of uncertainty, but federal agencies frequently attempt to quantify intangible or ancillary environmental harms in the context of notice-and-comment rulemaking.[37] Indeed, they are often *required* to do so by executive order.[38] In truth, simply by setting a fine level for a given violation, NOAA is making an implicit judgment about the harm caused by that violation. For instance, if the penalty is set at $10,000 for a violation with a 10% probability of detection, NOAA is effectively suggesting that the expected harm from that act is $1,000. An explicit valuation process simply ensures that these judgments are made deliberately and transparently.

If certain harms prove particularly difficult to monetize, NOAA should keep in mind that the private economic benefit associated with a violation provides a useful penalty baseline. After all, Congress would presumably not have chosen to prohibit a given behavior if, in the average case, the social costs of the act did not exceed its benefits. If the average benefit gained from violating a mesh size regulation is $15,000 per trip, for instance, the agency can assume that the average harm of that violation is, at minimum, $15,000.01.[39]

NOAA Should Provide a Clear and Consistent Benefit for Self-Reporting

The Draft Policy already indicates that cooperation can be a mitigating factor justifying a reduction in penalty, but leaves the applicability and magnitude of this benefit to the discretion of the enforcement attorney.[40] NOAA should revise this section to state that the self-reporting of a violation is an automatic mitigating factor and then specify the percentage by which the fine will be reduced. Publicizing this information will ensure that the full benefit of self-reporting will be

realized.

Self-reporting is a way to mitigate the problem of inconsistent enforcement. In a scenario with varying probabilities of detection among groups of actors, the high-probability group will experience over-deterrence while the low-probability group will experience under-deterrence.[41] Self-reporting can be encouraged by offering a reduction in the penalty. Efficiency is improved under such a regime because the probability of detection is increased without a corresponding increase in enforcement costs.[42] Further, because the self-reporting incentive will have the greatest effect on those who are most often apprehended, it will lower the overall fines for this group of offenders and therefore offset unfairness resulting from their increased detection. Those in the group with a low probability of detection are less likely to self-report, and the fine can therefore be kept high enough to create adequate deterrence for this group.[43]

Where Deterrence Through Fines Is Statutorily Impossible and Where Violators Are Judgment-Proof, NOAA Should Employ Permit Sanctions

Non-monetary sanctions are in most cases economically undesirable forms of punishment, because, in contrast to fines, "the disutility experienced by parties punished by nonmonetary sanctions is not balanced in any automatic way by additions to the utility of other parties."[44] When NOAA employs a permit suspension in response to a violation, it denies the violator the economic benefit of continuing to fish without securing any additional revenue for taxpayers.[45] This represents a net loss for society from the perspective of aggregate welfare.[46]

Nevertheless, in some instances, the harm from a particular violation will be so great that, even with a high probability of detection, optimal deterrence cannot be achieved within statutory fine limits. When this is the case, permit sanctions might prove NOAA's only available means of producing compliance. When tailoring the length of the suspension, however, the agency should ensure that the benefits of additional deterrence flowing from the sanction outweigh the productivity loss associated with its imposition.

Permit sanctions might also prove useful when NOAA confronts the judgment-proof problem—that is, when a higher monetary penalty offers no additional deterrent value for a violator because it exceeds her level of solvency.[47] If a violator has only $10,000 in assets, for example, she has no greater incentive to refrain from violating a provision that carries an $80,000 penalty than she does from violating one that carries an $11,000 penalty. This may lead her to engage in excessively risky behavior. NOAA may encounter cases in which a party is not able to pay the optimal fine and yet can bear the cost of a permit sanction of equal or greater value. In these instances, the permit option should be utilized.

Where Fines Appear Grossly Disproportionate to the Harm at Issue, NOAA Should Either Raise the Probability of Detection or Consider Non-Punitive Means of Encouraging Compliance

Earlier discussions of fairness focused on concerns regarding liability unconnected to fault. Even in cases of willful violation, however, a penalty that is grossly disproportionate to the magnitude of harm will likely be perceived as unfair.[48] In such cases, despite the fact that traditional thinking would suggest pairing the maximum fine with a minimum probability of detection, NOAA might be better served by raising the probability of detection so that the fine can be brought to a more reasonable level.

In other cases, however, deterrence will be unachievable, not due to a high magnitude of expected harm, but due to the impracticability of detection. The economic research states that if the enforcement costs increase past a certain level, then the optimal probability of detection will be equal to zero.[49] This occurs because, as enforcement costs rise, they will at some point outweigh the benefit of reducing the harm from the violation. For example, if a particular (and particularly minor) gear violation can only be detected by having teams of divers inspect nets, NOAA would either need to spend an enormous amount of resources on enforcement or impose a hugely disproportionate penalty in order to achieve optimal deterrence. The former strategy seems an unwise allocation of limited agency resources, while the latter strategy jeopardizes the relationship between the agency and the regulated community. As a result, it might make sense in such instances to deemphasize penalties and focus on alternate means of inducing compliance, such as educational efforts or subsidizing the cost of the requisite gear. Past practices have shown that the educational tactic can be effective,[50] and NOAA's recent hiring of outreach specialists to serve the Gloucester fishing community seems to be in line with this alternative approach.[51]

NOAA Should Rethink Its "Economic Benefit" Adjustment Factor

The Draft Policy claims that adding an amount "equal to the benefit of noncompliance" to the base penalty will "remove any economic benefit gained by the alleged violator through his or her conduct."[52] First, this is not true, because the adjustment factor fails to take into account the probability of detection. Thus, the violator's *expected* penalty remains well below the economic benefit of noncompliance, and the violator retains an incentive to break the law. Second, and more importantly, one should only take economic benefit into account if striving for total compliance rather than optimal compliance (and in that case one calculates a benefit-based penalty *in lieu of*, not *in addition to,* a harm-based penalty).[53] Theoretically, if the harm and probability are accurately estimated when calculating the fine, then the only violations that continue to occur will be socially desirable violations (those where the person has internalized the social costs and still finds it worthwhile to break the law). In other words, if the violator is making a great deal more profit from selling illegal fish than he is losing a result of NOAA's fine, then either (1) the agency underestimated the harm associated with the given act when establishing the base fine, *or* (2) the selling of this fish is simply not a bad thing from the perspective of aggregate welfare. Either way, tacking on an adjustment to reclaim the benefit of the bad act does not solve the problem.

The one situation in which reclamation of economic benefit might prove beneficial from a deterrence standpoint is when the optimal base fine is above the statutory maximum for civil penalties. Since seizure of the fair market value of fish "taken or retained, in any manner, with or as a result of commission of any act prohibited by Section 307 [of the Magnuson-Stevens Act]" is not subject to penalty maximums,[54] the economic benefit factor might allow NOAA to reach the optimal overall monetary sanction and avoid resorting to the less desirable option of a permit sanction. In all cases, however, NOAA should force the violator to sell the fish (or the agency could itself make the sale) and then reclaim the revenue. Encouraging violators to abandon the illegally caught fish, as the Draft Policy does,[55] is the worst of all possible worlds from an aggregate welfare perspective. The harm to the resource cannot be undone, yet the market is denied the value of the fish and the taxpayer is denied any additional penalty revenue.

Conclusion

If NOAA hopes to achieve optimal deterrence, it must make probability of detection and expected harm the central focuses of its penalty calculations. The base penalty can then be adjusted to account for prior history, intent, cooperation with authorities, and, in a limited class of cases, economic benefit. When optimal deterrence cannot be achieved solely through fines due to statutory limitations, permit sanctions should be considered. Where the theoretically optimal fine raises fairness concerns, the agency should either raise the probability of detection or consider alternate means of encouraging compliance. Finally, because optimal fines can only be defined in relationship to detection rates, an effective deterrence scheme will require ongoing collaboration between those who detect violations and those who prosecute them. Going forward, NOAA should keep in mind that any future shift in its enforcement resources or strategies will require concurrent recalibration of its penalty levels.

Notes

1   Office of Inspector General, U.S. Dept. of Commerce, Report No. OIG-19887-2, Review of NOAA Fisheries Enforcement Programs and Operations 6 (2010), *available at* http://www.oig.doc.gov/oig/reports/2010/OIG-19887-2.pdf.

2   *Id.* at 7.

3   Richard Gaines, *Senator Presses for Explanations on NOAA "Reassignments,"* Gloucester Times, Nov. 2, 2010.

4   NOAA Office of General Counsel, Draft Policy for the Assessment of Civil Administrative Penalties and Permit Sanctions (October 18, 2010) [hereinafter "Draft Policy"].

5   A separate penalty matrix is provided for each major statute.

6   Gary S. Becker, *Crime and Punishment: An Economic Approach,* 76 J. Pol. Econ. 169, 192–93 (1968).

7   A. Mitchell Polinksy & Steven Shavell, *Enforcement Costs and the Optimal Magnitude and Probability of Fines*, 35 J. Law & Econ. 133, 136 (1992).

8   Dennis M. King & Jon G. Sutinen, *Rational Noncompliance and the Liquidation of Northeast Groundfish Resources*, 34 Marine Pol'y 7 (2010).

9   Polinsky & Shavell, *Enforcement Costs, supra* note 7, at 136.

10   *Id.* at 191.

11   *Id.* at 208 ("If costs were the same, the optimal values of both p and f would be greater, the greater the damage caused by an offense.").

12   *Id.* at 183 ("The loss would be minimized, therefore, by lowering p arbitrarily close to zero and raising f sufficiently high so that the product pf would induce the optimal number of offenses.").

13   *Id.* at 195 ("If the goal is to minimize the social loss in income from offenses, and not to take vengeance or to inflict harm on offenders, then fines should depend on the total harm done by offenders, and not directly on their income, race, sex, etc.").

14   *Id.* at 135-37. The model can be further defined by including costs for the prosecution phase as well as the probability of imposing a fine on an offender who has been detected by enforcement methods. This equation is represented as: $f^*(h) = h/pq + s/q + k,$ in which q represents the probability of assessing a fine after investigation and prosecution and s represents the cost of prosecuting during this phase of the case. *Id.* at 140.

15   Magnuson-Stevens Act, 16 U.S.C § 1858(a) (2010).

16   Another factor NOAA should consider when structuring its penalties is the dilutive effect of settlements. A fisher's calculation of the expected cost of violating regulations will include not only the probability of detection but also the probability of settling for a smaller penalty if caught. *See* A. Mitchell Polinsky & Steven Shavell, *Public Enforcement of Law, in* The New Palgrave Dictionary of Economics 7 (2d ed. 2008). To counter this effect, fines or probabilities of detection will need to be raised. *Id.*

17   *See, e.g.,* Louis Kaplow & Steven Shavell, Principles of Fairness versus Human Welfare: On the Evaluation of Legal Policy 295 (Harvard John M. Olin Center for Law, Economics, and Business, 2000), *available at* http://www.law.harvard.edu/programs/olin_center.

18   *See, e.g.,* John C. Coffee, Jr., *Paradigms Lost: The Blurring of the Criminal and Civil Law Models—And What Can Be Done About It,* 101 Yale L. J. 1875, 1876 (1992) ("[C]ivil penalties should be used to deter . . . where the regulated activity has positive social utility but is imposing externalities on others.").

19   Polinsky & Shavell, *Public Enforcement of Law, supra* note 16, at 4.

20   *Id.* at 9 ("[A]ny factor that influences individuals' well-being is relevant under welfare economics and, in strict

logic, a taste for fairness is no different than a taste for a tangible good or anything else.").

21 Steven Shavell, *Criminal Law and the Optimal Use of Nonmonetary Sanctions as a Deterrent*, 85 Colum. L. Rev. 1232, 1248 (1985).

22 *Id.*

23 *Id.*

24 A. Mitchell Polinsky & Steven Shavell, *The Fairness of Sanctions: Some Implications for Optimal Enforcement Policy*, 2 Amer. L. & Econ. Rev. 223, 224 (2000).

25 Jeffrey K. Randall, *Improving Compliance in U.S. Federal Fisheries: An Enforcement Agency Perspective*, 32 Ocean Dev. & Int'l L. 287, 297 (2004).

26 Equity, of course, might require more than attention to culpability. Studies also show, for example, that many fishers feel regulations tend to favor large vessels over smaller fishing operations. *See* King & Sutinen, *supra* note 8.

27 Polinsky & Shavell, *The Fairness of Sanctions*, *supra* note 24, at 235.

28 *See, e.g.*, Magnuson-Stevens Act, 16 U.S.C § 1858(a) ("In determining the amount of such penalty, the Secretary shall take into account . . . with respect to the violator, the degree of culpability, any history of prior offenses, and such other matters as justice may require."). *See also* Lacey Act, 16 U.S.C. § 3373(a)(6) (2010); Northern Pacific Halibut Act, 16 U.S.C. § 773f(a) (2010).

29 *See, e.g.*, National Marine Sanctuaries Act, 16 U.S.C. § 1427(d) (2010); Endangered Species Act, 16 U.S.C. § 1540(a).

30 *See* Draft Policy, *supra* note 4, at 9.

31 Lucian Arye Bebchuk & Louis Kaplow, *Optimal Sanctions When Individuals Are Imperfectly Informed About Probability of Apprehension*, 21 J. Legal Studies 365, 366 (1992).

32 *Id.*

33 For violations where the community *over*estimates the probability of detection, NOAA has little reason to correct this misconception, as this enables it to minimize enforcement costs. For violations where the community *under*estimates the probability of detection, on the other hand, the agency has an interest in making perceptions more accurate. By drawing greater attention to its existing investigative activities, the agency might get increased deterrence for the same level of enforcement expenditure.

34 *See, e.g.*, Dennis M. King et al., An Economic, Legal and Institutional Assessment of Enforcement and Compliance in Federally Managed Fisheries iv (Lenfest Ocean Program, 2009), *available at* http://dkingweb.cbl.umces.edu/Lenfest%20Underlying%20Report_%202009.pdf.

35 Draft Policy, *supra* note 4, at 7. One of the listed factors relates to the difficulty of detection. If this report's recommendation to include probability as its own axis on the penalty matrix is adopted, this factor should be excised from the harm calculation. On the contrary, if the above recommendation is not adopted, probability should be made a key component of the harm rankings.

36 For commercial value estimation techniques, see generally Terry Hiatt et al., Stock Assessment and Fishery Evaluation Report for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea Aleutian Islands Area: Economic Status of the Groundfish Fisheries Off Alaska, 2008 (2009), *available at* http://www.afsc.noaa.gov/refm/docs/2009/economic.pdf; *see also* Alaska Marine Conservation Council, Commercial Fisheries Value, http://www.akmarine.org/our-work/protect-bristol-bay/fisheries-resources. Certain fisheries may also have addition use values beside commercial fishing, such as recreation, as well as non-use values.

37 *See, e.g.*, Environmental Protection Agency, Guidelines for Preparing Economic Analyses (Sept. 12, 2008) (featuring guidelines on the use of valuation tools such as recreation demand studies and hedonic pricing models).

38 Exec. Order 12,866, 58 Fed. Reg. 51,736 (Oct. 4, 1993) ("Each agency shall assess both the costs and benefits of the regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only upon a determination that the benefits of the intended regulation justify its costs.").

39 For economic benefit estimates, see King & Sutinen, *supra* note 8, at 7-8.

[40] Draft Policy, *supra* note 4, at 10.

[41] Robert Innes, *Self-Reporting in Optimal Law Enforcement When Violators Have Heterogeneous Probabilities of Detection*, 29 J. Legal Studies 287, 294 (2000).

[42] *Id.* at 288.

[43] *Id.* at 289.

[44] Steven Shavell, *Criminal Law and the Optimal Use of Nonmonetary Sanctions as a Deterrent*, 85 Colum. L. Rev. 1232, 1235 (1985).

[45] This example assumes that the suspended violator will not pursue any other equally productive employment during his or her period of suspension.

[46] The costs of permit *revocation* as opposed to suspension are more difficult to ascertain, as we might assume that the affected party will put his or her skills to use in another industry. There will nevertheless be transition costs associated with this re-allocation of resources.

[47] *See* Steven Shavell, *The Judgment Proof Problem*, 6 Int'l Rev. L. & Econ. 45, 45 (1986).

[48] Polinsky & Shavell, *The Fairness of Sanctions*, *supra* note 24, at 234.

[49] Polinksy & Shavell, *Enforcement Costs*, *supra* note 7, at 138.

[50] NOAA's participation in an educational program in Alaska resulted in the reduction of recordkeeping violations that were due to ignorance or incompetence. Randall, *supra* note 25, at 313 n.26.

[51] *See* Press Release, NOAA Office of Law Enforcement, New Outreach Positions to Help NE Fishermen Comply with Regulations (Nov. 29, 2010) (*available at* http://www.nmfs.noaa.gov/ole/news/news_ned_112910.htm).

[52] Draft Policy, *supra* note 4, at 4.

[53] *See* Coffee, *supra* note 18, at 1882. Coffee refers to this distinction as the difference between pricing behavior and prohibiting behavior.

[54] 16 U.S.C. § 1860(a).

[55] *See* Draft Policy, *supra* note 4, at 11.

Institute for Policy Integrity • New York University School of Law
Wilf Hall, 139 MacDougal Street • New York, New York 10012 • www.policyintegrity.org