



Appendix 4: Measures for the management of catastrophic storm damage to forests: Summaries for major storms in Europe

Table 1: Summary of different measures relative to the occurrence of storms.

Alert and emergency	
	Safety measures before, during and after the storm (prohibited access)
	Establishment of crisis committees
	Information and communication measures
	Clearing in order to re-establish roads and other essential services
	Inventory of damages (physical terms, monetary terms, others).
	Psychological support if necessary
Rehabilitation	
	Rehabilitation of forest roads and trails
	Rehabilitation of fire infrastructure and equipment
	Rehabilitation of recreational infrastructure and equipment
	Rehabilitation of other infrastructure and equipment (drainage network, others)
Salvage operations	
	Organization of wood removals
	Incentives to harvest blown timber
	Incentives to acquire new forest machines (harvesters, logging

	machines).
	Professional retraining and training
	Creation of new infrastructures in order to enable wood removals
	Rehabilitation of forest infrastructure damaged by post storm forest operations
	Adaptation of transportation regulation
	Long distance transportation
	Storage of roundwood and other wood raw materials
	Storage of sawnwood and other processed products.
Marketing of forest products	
	Collective agreements between purchasers and sellers of wood raw materials
	Financing roundwood removals and logging costs
	Financial guarantees for roundwood buyers
	Facilitating exports
	Limiting imports
	Promoting the use of wood products
Supporting forest net revenues	
	Direct support of forest income for damaged forests
	Direct support of forest income for non-damaged forests
	Reduction of taxes on capital
	Reduction of taxes on income
	Reduction of value added tax
	Accelerated depreciation of logging equipment
Protection	
	Protection against pests and diseases
	Prevention against forest fires
	Restoration of the ecological balance between game species and forests

Reforestation	
	Foresight studies
	Restructuring if necessary
	Regulation of forest restoration
	Cleaning of compartments and plots
	Support for regeneration
	Support for nurseries
	Restoration of young plantations (seedlings in upright position again)
Prevention	
	Risk management
	Consideration of forest insurance
	Design and agree a crisis management plan
	Analysis of the potential effects of other policies
Research studies	
	Forest vulnerability assessment and mapping
	Improvement of forest restoration
Cross-cutting measures	
	Establishment of special public/private efforts aimed at collecting donations
	Reinforcing temporarily forest staff
	Agreements between different public policies
	Agreement between public policies at different scales (Regions, States, Europe)
	Agreements between the administration, the forest-based sector and the bank system
	Developing post-storm forest plans

*Table 1: Summary of different measures for **storm of January 1953 in Scotland**.*

Categories of measures and measures themselves		Comments
Alert and emergency		
	Safety measures before, during and after the storm (prohibited access)	
	Establishment of crisis committees	
	Information and communication measures	
	Clearing in order to re-establish roads and other essential services	
	Inventory of damages (physical terms, monetary terms, others).	
	Psychological support if necessary	
	Safety measures before, during and after the storm (prohibited access)	
Rehabilitation		
	Rehabilitation of forest roads and trails	
	Rehabilitation of fire infrastructure and equipment	
	Rehabilitation of recreational infrastructure and equipment	
	Rehabilitation of other infrastructure and equipment (drainage network, others)	
Salvage operations		
	Organization of wood removals	Suspension of the licensing of standing softwood timber; concentration on blown timber
	Incentives to harvest blown timber	
	Incentives to acquire new forest machines (harvesters, logging machines).	
	Professional retraining and training	
	Creation of new infrastructures in order to enable wood removals	

	Rehabilitation of forest infrastructure damaged by post storm forest operations	
	Adaptation of transportation regulation	
	Long distance transportation	
	Storage of roundwood and other wood raw materials	
	Storage of sawnwood and other processed products.	
Marketing or forest products		
	Collective agreements between purchasers and sellers of roundwood	
	Financing of roundwood removals and logging costs	
	Financial guarantees for roundwood buyers	
	Facilitating exports	
	Limiting imports	
	Promoting the use of wood products	
Supporting forest net revenues		
	Direct support of forest income for damaged forests	
	Direct support of forest income for non-damaged forests	
	Reduction of taxes on capital and wealth	
	Reduction of taxes on income	
	Reduction of value added tax	
	Accelerated depreciation of logging equipment	
Protection		
	Protection against pests and diseases	
	Prevention against forest fires	
	Restoring of the ecological balance between game species and forests	

Reforestation		
	Foresight studies	
	Restructuring if necessary	
	Regulation of forest restoration	
	Cleaning of compartments and plots	
	Support for regeneration	
	Support for nurseries	
	Restoration of young plantations (seedlings in upright position again)	
Prevention		
	Risk management	
	Consideration of forest insurance	
	Design and agree a crisis management plan	
	Analysis of the potential effects of other policies	
Research studies		
	Forest vulnerability assessment and mapping	
	Improvement of forest restoration	
Cross-cutting measures		
	Establishment of special funds aimed at collecting donations for the forests	
	Reinforcing temporarily forest staff	
	Agreements between different public policies	
	Agreement between public policies at different scales (Regions, States, Europe)	
	Agreements between the administration, the forest-based sector and the bank system	
	Developing post-storm forest plans	

*Table 3: Summary of different measures for **storms of 1967 in Germany (DE), Austria (AT) and Switzerland (CH).***

Categories of measures and measures themselves		Comments
Alert and emergency		
	Safety measures before, during and after the storm (prohibited access)	
	Establishment of crisis committees	
	Information and communication measures	
	Clearing in order to re-establish roads and other essential services	
	Inventory of damages (physical terms, monetary terms, others).	
	Psychological support if necessary	
	Safety measures before, during and after the storm (prohibited access)	
Rehabilitation		
	Rehabilitation of forest roads and trails	
	Rehabilitation of fire infrastructure and equipment	
	Rehabilitation of recreational infrastructure and equipment	
	Rehabilitation of other infrastructure and equipment (drainage network, others)	
Salvage operations		
	Organization of wood removals	CH: Reduction of planned cuts for several years
	Incentives to harvest blown timber	DE: Interest price reduction for the processing of storm damaged timber in community and large private

		forests. 1.4 M€; additional measure in Baden-Württemberg
	Incentives to acquire new forest machines (harvesters, logging machines).	AT: support of mechanisation
	Professional retraining and training	
	Creation of new infrastructures in order to enable wood removals	
	Rehabilitation of forest infrastructure damaged by post storm forest operations	
	Adaptation of transportation regulation	
	Long distance transportation	DE: Freight trains for short distance hauling authorized for long distance; reduction of transport taxes
	Storage of roundwood and other wood raw materials	DE: Timber supply bonus to promote storage of fir and spruce roundwood
	Storage of sawnwood and other processed products.	
Marketing or forest products		
	Collective agreements between purchasers and sellers of roundwood	
	Financing of roundwood removals and logging costs	
	Financial guarantees for roundwood buyers	
	Facilitating exports	DE: Restrictions towards the export to third countries was lifted. Financial aid for the export of coniferous wood was provided by the State of Baden-Württemberg AT: primary focus on development of exports

		CH: 30% of blown timber exported to France and Italy with the governmental support
	Limiting imports	
	Promoting the use of wood products	
Supporting forest net revenues		
	Direct support of forest income for damaged forests	DE: Support of small private forest owners (less than 5 ha) at 2.5 €/m ³ . Timber damage bonus in Baden-Württemberg
	Direct support of forest income for non-damaged forests	
	Reduction of taxes on capital and wealth	
	Reduction of taxes on income	
	Reduction of value added tax	
	Accelerated depreciation of logging equipment	
Protection		
	Protection against pests and diseases	
	Prevention against forest fires	
	Restoring of the ecological balance between game species and forests	
Reforestation		
	Foresight studies	
	Restructuring if necessary	
	Regulation of forest restoration	
	Cleaning of compartments and plots	
	Support for regeneration	DE: 1.81 M€ (Federal government) and 0.6 M€ in Baden-Württemberg AT: support

		CH: subsidies up to 50% of the reforestation costs in private forests. Some cantons provide guidelines for the selection of tree species.
	Support for nurseries	
	Restoration of young plantations (seedlings in upright position again)	
Prevention		
	Risk management	
	Consideration of forest insurance	
	Design and agree a crisis management plan	
	Analysis of the potential effects of other policies	
Research studies		
	Forest vulnerability assessment and mapping	
	Improvement of forest restoration	
Cross-cutting measures		
	Establishment of special funds aimed at collecting donations for the forests	
	Reinforcing temporarily forest staff	
	Agreements between different public policies	
	Agreement between public policies at different scales (Regions, States, Europe)	
	Agreements between the administration, the forest-based sector and the bank system	
	Developing post-storm forest plans	DE: Forest damage compensation act (emergency measures, stabilization of markets, creation of an economic

		equalization fund, tax reliefs for forest owners and enterprises)
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*Table 4: Summary of different measures for **storm of September 1969 in Sweden**.*

Categories of measures and measures themselves		Comments
Alert and emergency		
	Safety measures before, during and after the storm (prohibited access)	
	Establishment of crisis committees	
	Information and communication measures	
	Clearing in order to re-establish roads and other essential services	
	Inventory of damages (physical terms, monetary terms, others).	
	Psychological support if necessary	
	Safety measures before, during and after the storm (prohibited access)	
Rehabilitation		
	Rehabilitation of forest roads and trails	
	Rehabilitation of fire infrastructure and equipment	
	Rehabilitation of recreational infrastructure and equipment	
	Rehabilitation of other infrastructure and equipment (drainage network, others)	
Salvage operations		
	Organization of wood removals	Felling restrictions in remaining forests
	Incentives to harvest blown timber	Subsidies
	Incentives to acquire new forest machines (harvesters, logging machines).	
	Professional retraining and training	

	Creation of new infrastructures in order to enable wood removals	
	Rehabilitation of forest infrastructure damaged by post storm forest operations	
	Adaptation of transportation regulation	
	Long distance transportation	Subsidies
	Storage of roundwood and other wood raw materials	Subsidies
	Storage of sawnwood and other processed products.	
Marketing or forest products		
	Collective agreements between purchasers and sellers of roundwood	
	Financing of roundwood removals and logging costs	
	Financial guarantees for roundwood buyers	
	Facilitating exports	
	Limiting imports	
	Promoting the use of wood products	
Supporting forest net revenues		
	Direct support of forest income for damaged forests	
	Direct support of forest income for non-damaged forests	
	Reduction of taxes on capital and wealth	
	Reduction of taxes on income	
	Reduction of value added tax	
	Accelerated depreciation of logging equipment	
Protection		
	Protection against pests and diseases	More strict regulation in 1978, particularly concerning unbarked logs:

		limitation of the period during which they can be stored in forest, transportation rules outside of the forest, maximum volume left in forests. 2.7 M€ to control spruce bark beetle populations
	Prevention against forest fires	
	Restoring of the ecological balance between game species and forests	
Reforestation		
	Foresight studies	
	Restructuring if necessary	
	Regulation of forest restoration	
	Cleaning of compartments and plots	
	Support for regeneration	
	Support for nurseries	
	Restoration of young plantations (seedlings in upright position again)	
Prevention		
	Risk management	
	Consideration of forest insurance	
	Design and agree a crisis management plan	
	Analysis of the potential effects of other policies	
Research studies		
	Forest vulnerability assessment and mapping	
	Improvement of forest restoration	
Cross-cutting measures		
	Establishment of special funds aimed at	

	collecting donations for the forests	
	Reinforcing temporarily forest staff	
	Agreements between different public policies	
	Agreement between public policies at different scales (Regions, States, Europe)	
	Agreements between the administration, the forest-based sector and the bank system	
	Developing post-storm forest plans	

*Table 5: Summary of different measures for **storm of November 1972 in the Netherlands (NL) and Germany (DE).***

Categories of measures and measures themselves		Comments
Alert and emergency		
	Safety measures before, during and after the storm (prohibited access)	
	Establishment of crisis committees	
	Information and communication measures	
	Clearing in order to re-establish roads and other essential services	
	Inventory of damages (physical terms, monetary terms, others).	
	Psychological support if necessary	
	Safety measures before, during and after the storm (prohibited access)	
Rehabilitation		
	Rehabilitation of forest roads and trails	
	Rehabilitation of fire infrastructure and equipment	
	Rehabilitation of recreational infrastructure and equipment	
	Rehabilitation of other infrastructure and equipment (drainage network, others)	
Salvage operations		
	Organization of wood removals	DE: Reduction of planned cuttings (-20%) NL: Reduction of cutting in State forests
	Incentives to harvest blown timber	
	Incentives to acquire new forest machines	

	(harvesters, logging machines).	
	Professional retraining and training	
	Creation of new infrastructures in order to enable wood removals	
	Rehabilitation of forest infrastructure damaged by post storm forest operations	
	Adaptation of transportation regulation	
	Long distance transportation	
	Storage of roundwood and other wood raw materials	
	Storage of sawnwood and other processed products.	
Marketing or forest products		
	Collective agreements between purchasers and sellers of roundwood	
	Financing of roundwood removals and logging costs	
	Financial guarantees for roundwood buyers	
	Facilitating exports	
	Limiting imports	DE: temporary authorization of the European Community to limit imports
	Promoting the use of wood products	
Supporting forest net revenues		
	Direct support of forest income for damaged forests	NL: Fixed amount of money per cubic metre if it is harvested and either removed from the forest or barked within some months (21 florins/m3)
	Direct support of forest income for non-damaged forests	
	Reduction of taxes on capital and wealth	DE: Reduction of taxes

	Reduction of taxes on income	
	Reduction of value added tax	
	Accelerated depreciation of logging equipment	
Protection		
	Protection against pests and diseases	
	Prevention against forest fires	
	Restoring of the ecological balance between game species and forests	
Reforestation		
	Foresight studies	
	Restructuring if necessary	
	Regulation of forest restoration	NL: Reforestation is not compulsory in some places because of nature conservation or landscape management.
	Cleaning of compartments and plots	DE: Subsidies
	Support for regeneration	NL: Subsidies (50%)
	Support for nurseries	
	Restoration of young plantations (seedlings in upright position again)	
Prevention		
	Risk management	
	Consideration of forest insurance	
	Design and agree a crisis management plan	
	Analysis of the potential effects of other policies	
Research studies		
	Forest vulnerability assessment and mapping	
	Improvement of forest restoration	

Cross-cutting measures		
	Establishment of special funds aimed at collecting donations for the forests	
	Reinforcing temporarily forest staff	NL: additional staff for State forests; all normal staff let for private forests
	Agreements between different public policies	
	Agreement between public policies at different scales (Regions, States, Europe)	
	Agreements between the administration, the forest-based sector and the bank system	
	Developing post-storm forest plans	

*Table 6: Summary of different measures for **storm of October 1987 in England (UK) and France (FR).***

Categories of measures and measures themselves		Comments
Alert and emergency		
	Safety measures before, during and after the storm (prohibited access)	
	Establishment of crisis committees	UK: creation of the Forest Windblow Action Committee
	Information and communication measures	UK: publication of a booklet "Guidelines for dealing with windblow in woodlands" within 3 months; creation of a Windblow Task Force at the Forestry Commission's Research Station of Alice Holt Lodge (advice and information to woodland owners, timber merchants, contractors and enquirers.
	Clearing in order to re-establish roads and other essential services	FR: Help of the French Army
	Inventory of damages (physical terms, monetary terms, others).	FR: Field assessment UK: field assessment within one month
	Psychological support if necessary	UK:
	Safety measures before, during and after the storm (prohibited access)	
Rehabilitation		
	Rehabilitation of forest roads and trails	FR: subsidies: 50%
	Rehabilitation of fire infrastructure and equipment	

	Rehabilitation of recreational infrastructure and equipment	
	Rehabilitation of other infrastructure and equipment (drainage network, others)	
Salvage operations		
	Organization of wood removals	UK: the Forest Commission deferred harvesting in less damaged areas
	Incentives to harvest blown timber	
	Incentives to acquire new forest machines (harvesters, logging machines).	FR: subsidies (30%)
	Professional retraining and training	FR: Yes UK: Yes for 100 men
	Creation of new infrastructures in order to enable wood removals	FR: subsidies (50%) for roads, dry storage areas
	Rehabilitation of forest infrastructure damaged by post storm forest operations	
	Adaptation of transportation regulation	
	Long distance transportation	FR: reduction of the transportation cost by rail; from 18% to 65% of the normal rail price. UK: Subsidies for road and rail but with a delayed announcement (8 months); shortage of haulage capacity.
	Storage of roundwood and other wood raw materials	FR: reduced interest loans (6%) for local sawmills and two years; financial guarantee (2/3) by regional and departmental councils; building of storage areas by the administration.

		UK: one site (wet storage) of 50 000 m3 for about 0.1 actual M€
	Storage of sawnwood and other processed products.	
Marketing or forest products		
	Collective agreements between purchasers and sellers of roundwood	FR: monitoring of roundwood markets; virtual market place for roundwood and workers UK: list of contractors
	Financing of roundwood removals and logging costs	FR: reduced interest loans; ; financial guarantee (2/3) by regional and departmental councils
	Financial guarantees for roundwood buyers	
	Facilitating exports	
	Limiting imports	
	Promoting the use of wood products	
Supporting forest net revenues		
	Direct support of forest income for damaged forests	
	Direct support of forest income for non-damaged forests	
	Reduction of taxes on capital and wealth	
	Reduction of taxes on income	
	Reduction of value added tax	
	Accelerated depreciation of logging equipment	
Protection		
	Protection against pests and diseases	FR: some measures taken
	Prevention against forest fires	
	Restoring of the ecological balance between	

	game species and forests	
Reforestation		
	Foresight studies	
	Restructuring if necessary	
	Regulation of forest restoration	
	Cleaning of compartments and plots	
	Support for regeneration	FR: yes in the frame of the French forest fund. UK: grant aids for non woodlands and woodlands (about 15 actual M€)
	Support for nurseries	
	Restoration of young plantations (seedlings in upright position again)	
Prevention		
	Risk management	
	Consideration of forest insurance	
	Design and agree a crisis management plan	
	Analysis of the potential effects of other policies	
Research studies		
	Forest vulnerability assessment and mapping	
	Improvement of forest restoration	
Cross-cutting measures		
	Establishment of special funds aimed at collecting donations for the forests	
	Reinforcing temporarily forest staff	FR: important because Brittany is not a major forest region
	Agreements between different public policies	
	Agreement between public policies at different	

	scales (Regions, States, Europe)	
	Agreements between the administration, the forest-based sector and the bank system	FR: yes for reduced interest loans
	Developing post-storm forest plans	UK: lessons to be drawn from the storm and the activities of the Forest Windblow Action Committee

*Table 7: Summary of different measures for **storms of the Winter 1990 in Germany (DE) and Switzerland (CH).***

Categories of measures and measures themselves		Comments
Alert and emergency		
	Safety measures before, during and after the storm (prohibited access)	
	Establishment of crisis committees	
	Information and communication measures	
	Clearing in order to re-establish roads and other essential services	
	Inventory of damages (physical terms, monetary terms, others).	
	Psychological support if necessary	
	Safety measures before, during and after the storm (prohibited access)	
Rehabilitation		
	Rehabilitation of forest roads and trails	
	Rehabilitation of fire infrastructure and equipment	
	Rehabilitation of recreational infrastructure and equipment	
	Rehabilitation of other infrastructure and equipment (drainage network, others)	
Salvage operations		
	Organization of wood removals	CH: Avoidance of any planned harvests
	Incentives to harvest blown timber	DE Yes CH: 370 M Swiss francs
	Incentives to acquire new forest machines (harvesters, logging machines).	CH: Yes

	Professional retraining and training	
	Creation of new infrastructures in order to enable wood removals	CH; Timber yards
	Rehabilitation of forest infrastructure damaged by post storm forest operations	
	Adaptation of transportation regulation	
	Long distance transportation	
	Storage of roundwood and other wood raw materials	CH: Subsidies for storage areas and transportation to them.
	Storage of sawnwood and other processed products.	
Marketing or forest products		
	Collective agreements between purchasers and sellers of roundwood	
	Financing of roundwood removals and logging costs	
	Financial guarantees for roundwood buyers	
	Facilitating exports	
	Limiting imports	
	Promoting the use of wood products	CH: Support of procurement and purchase of storm damaged timber.
Supporting forest net revenues		
	Direct support of forest income for damaged forests	DE: particularly for communal forests (Länder)
	Direct support of forest income for non-damaged forests	
	Reduction of taxes on capital and wealth	
	Reduction of taxes on income	
	Reduction of value added tax	
	Accelerated depreciation of logging equipment	

Protection		
	Protection against pests and diseases	DE: protection against bark beetle of storm damaged timber
	Prevention against forest fires	
	Restoring of the ecological balance between game species and forests	
Reforestation		
	Foresight studies	
	Restructuring if necessary	
	Regulation of forest restoration	
	Cleaning of compartments and plots	
	Support for regeneration	
	Support for nurseries	
	Restoration of young plantations (seedlings in upright position again)	CH: tending of young stands
Prevention		
	Risk management	
	Consideration of forest insurance	
	Design and agree a crisis management plan	
	Analysis of the potential effects of other policies	
Research studies		
	Forest vulnerability assessment and mapping	
	Improvement of forest restoration	
Cross-cutting measures		
	Establishment of special funds aimed at collecting donations for the forests	
	Reinforcing temporarily forest staff	CH: Military personnel for assistance in salvage

		logging; promotion towards foreign contractors
	Agreements between different public policies	
	Agreement between public policies at different scales (Regions, States, Europe)	
	Agreements between the administration, the forest-based sector and the bank system	
	Developing post-storm forest plans	

Table 8 : Summary of different measures for **post 1999** storms in **France**.

Categories of measures and measures themselves		Comments
Alert and emergency		
	Safety measures before, during and after the storm (prohibited access)	Regulation
	Establishment of crisis committees	Not really
	Information and communication measures	Not really
	Clearing in order to re-establish roads and other essential services	General weather forecasts.
	Inventory of damages (physical terms, monetary terms, others).	12,7 M€
	Psychological support if necessary	3,1 M€
	Safety measures before, during and after the storm (prohibited access)	Not organised
Rehabilitation		
	Rehabilitation of forest roads and trails	Nothing else than clearing (see above)
	Rehabilitation of fire infrastructure and equipment	
	Rehabilitation of recreational infrastructure and equipment	4,6 + 11,4 M€ (State + Region)
	Rehabilitation of other infrastructure and equipment (drainage network, others)	
Salvage operations		
	Organization of wood removals	Priority to blown timber Priority to communal forests/state forests
	Incentives to harvest blown timber	
	Incentives to acquire new forest machines (harvesters, logging machines).	57 M€

	Professional retraining and training	Yes
	Creation of new infrastructures in order to enable wood removals	56,3 M€
	Rehabilitation of forest infrastructure damaged by post storm forest operations	
	Adaptation of transportation regulation	From 40 to 48 tons
	Long distance transportation	198,0 M€
	Storage of roundwood and other wood raw materials	27,1 + 50,6 (interest subsidy) = 77,7 M€
	Storage of sawnwood and other processed products.	No
Marketing or forest products		
	Collective agreements between purchasers and sellers of roundwood	Yes
	Financing of roundwood removals and logging costs	26,5 M€ (interest subsidy)
	Financial guarantees for roundwood buyers	3,0 M€ (State + Region)
	Facilitating exports	No
	Limiting imports	No
	Promoting the use of wood products	1,5 M€ and Framework agreement
Supporting forest net revenues		
	Direct support of forest income for damaged forests	53,2 M€
	Direct support of forest income for non-damaged forests	7,0 M€ (interest subsidy)
	Reduction of taxes on capital and wealth	Yes (land tax for two years and general delay ; confirmation of past reductions on wealth despite the stand destruction)
	Reduction of taxes on income	Yes (minus 10 €/harvested cum)

	Reduction of value added tax	Yes (reduced rate for all forest investments)
	Accelerated depreciation of logging equipment	Yes (intensive use)
Protection		
	Protection against pests and diseases	15.2 M€
	Prevention against forest fires	Reinforced cleaning
	Restoring of the ecological balance between game species and forests	Marked recommendations
Reforestation		
	Foresight studies	Yes (0,05 M€)
	Restructuring if necessary	8,2 M€ (State + Regions) + Law
	Regulation of forest restoration	Yes
	Cleaning of compartments and plots	155.9 M€ (State + Regions)
	Support for regeneration	450,9 M€
	Support for nurseries	4.4 M€ (State + Regions) + 0.3 M€ (interests.)
	Restoration of young plantations (seedlings in upright position again)	0.8 M€
Prevention		
	Risk management	Research and studies
	Consideration of forest insurance	Debate
	Design and agree a crisis management plan	Yes for ONF
	Analysis of the potential effects of other policies	No
Research studies		
	Forest vulnerability assessment and mapping	2,4 M€
	Improvement of forest restoration	

Cross-cutting measures		
	Establishment of special funds aimed at collecting donations for the forests	Yes 17.7 M€ (State+Regions), 0,3 M€ (private)
	Reinforcing temporarily forest staff	Yes (+912 persons. years) and 33,0 M€
	Agreements between different public policies	Some conflicts in the environment field
	Agreement between public policies at different scales (Regions, States, Europe)	EU agreement, State/Regions agreements
	Agreements between the administration, the forest-based sector and the bank system	Yes (interest subsidies)
	Developing post-storm forest plans	Not really

Table 9: Summary of different measures for **storm of December 1999 in Germany**.

Categories of measures and measures themselves		Comments
Alert and emergency		
	Safety measures before, during and after the storm (prohibited access)	Yes
	Establishment of crisis committees	
	Information and communication measures	Frequent informative meetings between forest authorities and district foresters or with representatives of communal forests, private forest owners.
	Clearing in order to re-establish roads and other essential services	fast opening of public roads through personnel of State forest administration.
	Inventory of damages (physical terms, monetary terms, others).	aerial survey (helicopters); additional aerial surveys 5 months later
	Psychological support if necessary	
	Safety measures before, during and after the storm (prohibited access)	
Rehabilitation		
	Rehabilitation of forest roads and trails	Repair of forest roads; subsidies for private owners under 200ha (40% under 25 565 € and 50% above); other subsidies up to 70%.
	Rehabilitation of fire infrastructure and equipment	

	Rehabilitation of recreational infrastructure and equipment	
	Rehabilitation of other infrastructure and equipment (drainage network, others)	
Salvage operations		
	Organization of wood removals	Duly processing of all perishable, valuable hard wood for all types of forest ownership: planned delay in processing of coniferous timber in State forests to ensure priority processing, transportation and sale capacities for other forest owners. Restriction of the timber harvest of the current year to avoid excess supply
	Incentives to harvest blown timber	loans from the State (4-6 years, on year without repayment)
	Incentives to acquire new forest machines (harvesters, logging machines).	Loan programme subsidized by the State (term up to 20 years, 3 years without repayment, maximum amount 0.26 M€)
	Professional retraining and training	Information about safety for communal foresters and private forest owners.
	Creation of new infrastructures in order to enable wood removals	
	Rehabilitation of forest infrastructure damaged by post storm forest operations	
	Adaptation of transportation regulation	load limit increased from 40 to 46 tons (federal state);

		exemptions to the ban of driving on Sunday and public holidays as well as from the holiday travel ordinance.
	Long distance transportation	organization of logistics in railway, ship and truck by the federal state forest service for all types of forest owners ; the Deutsche Bahn is asked to provide capacities for increased timber haulage by train.
	Storage of roundwood and other wood raw materials	Establishment of wet and storages in small scale private forests and in state forests (in this latter case, blown timber comes from various ownership categories; financial support (40% of costs); reduced interest loans (3-4 years, minimum loans of 5 113 € or 30.70 €/m3; annual subsidies to cover current storage costs (3.1 €/m3 but 8.2 €/m3 in first year); development of new storage methods (wrapping timber in foil)
	Storage of sawnwood and other processed products.	reduced interest loan (federal state bank, federal subsidy bank)
Marketing or forest products		
	Collective agreements between purchasers	

	and sellers of roundwood	
	Financing of roundwood removals and logging costs	loans
	Financial guarantees for roundwood buyers	
	Facilitating exports	distance selling of timber in other states and in near neighbor countries depending on the market conditions. Nes customers for all kinds of forest owners.
	Limiting imports	
	Promoting the use of wood products	Sale promotion of blown timber.
Supporting forest net revenues		
	Direct support of forest income for damaged forests	direct subsidies for private forests in monetary form.
	Direct support of forest income for non-damaged forests	
	Reduction of taxes on capital and wealth	
	Reduction of taxes on income	Partial remission of income tax; reduced tax rate for processing blown timber
	Reduction of value added tax	
	Accelerated depreciation of logging equipment	
Protection		
	Protection against pests and diseases	debarking aid (2.56 €/m3)
	Prevention against forest fires	
	Restoring of the ecological balance between game species and forests	
Reforestation		
	Foresight studies	
	Restructuring if necessary	

	Regulation of forest restoration	
	Cleaning of compartments and plots	about 1000 €/ha with a maximum of 80% of the costs;
	Support for regeneration	Subsidies for natural regeneration, under planting or afforestation for all kinds of forest ownership with differences according to the stand: about 4000 €/ha for deciduous plantations, 2500 €/ha for mixed plantations with at least 40% deciduous, 767 €/ha for natural regeneration; nothing for pure conifer plantation; free reforestation planning for severely affected communal forests; special loan programme for reforestation; subsidies from the State
	Support for nurseries	
	Restoration of young plantations (seedlings in upright position again)	
Prevention		
	Risk management	
	Consideration of forest insurance	
	Design and agree a crisis management plan	
	Analysis of the potential effects of other policies	
Research studies		
	Forest vulnerability assessment and mapping	several studies, for example to reduce the risk of storm

		damages in forests
	Improvement of forest restoration	Studies on natural regeneration
Cross-cutting measures		
	Establishment of special funds aimed at collecting donations for the forests	
	Reinforcing temporarily forest staff	additional service personnel to provide advice for private forests.
	Agreements between different public policies	
	Agreement between public policies at different scales (Regions, States, Europe)	
	Agreements between the administration, the forest-based sector and the bank system	
	Developing post-storm forest plans	Development of a storm handbook on first measures and survey of damages, strategies and personnel management, salvage logging and work safety, timber storage, forest protection, timber transportation, regeneration and reforestation, subsidies and public policies.

*Table 10: Summary of different measures for **storm of 2005 in Germany**.*

Categories of measures and measures themselves		Comments
Alert and emergency		
	Safety measures before, during and after the storm (prohibited access)	Access to forest stands and unclean forest roads is forbidden. Access on clean forest road on own risks.
	Establishment of crisis committees	Crisis committee at the ministerial level (coordination). Crisis Committee in Southwestphalia (cooperation between the ministry, the federal forest office, forest federations and others.
	Information and communication measures	Establishment of an information center for security, communication and coordination immediately after the storm event to provide information and serve as a logistic center for forest owners, logging enterprises, timber trade companies etc for technical questions: damage assessment, work security, logistics, timber marketing, timber conservation, staff management, aid programmes; establishment of a call center hotline
	Clearing in order to re-establish roads and other essential services	Yes

	Inventory of damages (physical terms, monetary terms, others).	Centrally organized, based on aerial photos
	Psychological support if necessary	
	Safety measures before, during and after the storm (prohibited access)	
Rehabilitation		
	Rehabilitation of forest roads and trails	Yes
	Rehabilitation of fire infrastructure and equipment	
	Rehabilitation of recreational infrastructure and equipment	
	Rehabilitation of other infrastructure and equipment (drainage network, others)	Yes
Salvage operations		
	Organization of wood removals	Priority to blown timber
	Incentives to harvest blown timber	
	Incentives to acquire new forest machines (harvesters, logging machines).	Special loan from the State to purchase necessary machines (20 teays, 5 years without repayment.
	Professional retraining and training	Yes
	Creation of new infrastructures in order to enable wood removals	
	Rehabilitation of forest infrastructure damaged by post storm forest operations	
	Adaptation of transportation regulation	Temporary suspension of the cabotage ban. The load limit for timber transport is 44 tons instead of 40; exemptions to the ban of driving on Sundays and public holidays as well as from the holiday travel

		ordinance.
	Long distance transportation	Increase of transport capacities, use of intermodal transportation
	Storage of roundwood and other wood raw materials	Financial support for the building of storage places; waiving of collection of fees for water use.
	Storage of sawnwood and other processed products.	
Marketing or forest products		
	Collective agreements between purchasers and sellers of roundwood	Yes
	Financing of roundwood removals and logging costs	9 M€ (wood removals and forest protection)
	Financial guarantees for roundwood buyers	
	Facilitating exports	
	Limiting imports	
	Promoting the use of wood products	
Supporting forest net revenues		
	Direct support of forest income for damaged forests	
	Direct support of forest income for non-damaged forests	
	Reduction of taxes on capital and wealth	
	Reduction of taxes on income	Tax relief for undue hardship: 25% or 50% reduction
	Reduction of value added tax	
	Accelerated depreciation of logging equipment	
Protection		
	Protection against pests and diseases	General allowance for

		burning of residues under strict requirements; measures for insecticide-free combating of pests as well as chemical treatments with insecticides on an area of 3300 ha
	Prevention against forest fires	Cleaning and repairing of forest roads; restoration of water intake points; generating of "forest fire prevention map Kyrill 2007"
	Restoring of the ecological balance between game species and forests	
Reforestation		
	Foresight studies	
	Restructuring if necessary	
	Regulation of forest restoration	
	Cleaning of compartments and plots	
	Support for regeneration	Aid programme for private and communal forest owners for reforestation with broadleaves (56 M€); in 2010, this programme is still running as many forest owners wait how natural regeneration develops; furthermore planting material was not sufficiently available for all species; special loan programme for reforestation with conifers (2 M€); 16% increase of support for forest seedlings and bushes

	Support for nurseries	
	Restoration of young plantations (seedlings in upright position again)	
Prevention		
	Risk management	Development of a manual on storms
	Consideration of forest insurance	
	Design and agree a crisis management plan	Development of formal procedures in cas of storm events in North-Rhine-Westphalia.
	Analysis of the potential effects of other policies	
Research studies		
	Forest vulnerability assessment and mapping	
	Improvement of forest restoration	
Cross-cutting measures		
	Establishment of special funds aimed at collecting donations for the forests	
	Reinforcing temporarily forest staff	Additional service personnel to provide advices to private forest owners; unbureaucratic allocation of seasonal workers from eastern Europe
	Agreements between different public policies	
	Agreement between public policies at different scales (Regions, States, Europe)	
	Agreements between the administration, the forest-based sector and the bank system	
	Developing post-storm forest plans	Development of a manual on

		storms for North-Rhine-Westphalia
	Developing forest guidelines adapted to storms.	

